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ELECTRIC RAILWAY JOURNAL

lill Publishing Company, Inc. NOVEMBER 3, 1928 Twenty Cents Per Cop

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One of the Automotive Transportation Company's fleet of 81 White Busses, operated by Newport and Providence Railway.

## "Our Revenue Increased Substantially"

*—says William H. Vanderbilt*

"When, in August, 1927, we put into operation six White six-cylinder busses," writes William H. Vanderbilt, president of the Automotive Transportation Company, Inc., New York, "the enthusiasm created was such that our revenue increased substantially and the riding public was so pleased with them that we found it necessary to obtain four more that same year and later, when it was necessary to render special de luxe service, we naturally purchased three more Model 54 Whites.

"We operate in various localities in New England, and the conditions are so different that it is a satisfaction to feel that it is possible to use our 54's anywhere and be assured that they will perform satisfactorily. We operate these coaches about 5,000 miles per month and to date, at an average of 45,000 miles, we have had no major repairs or replacements.

"Since operating the White Six we find it less difficult to maintain our schedules, as gear shifting on grades is practically eliminated and it is a very rare occasion when second speed is resorted to, thus allowing an even, steady speed.

"We have occasional reports from our operators to the effect that they frequently meet other sixes of other makes, and without exception they all agree that they can out-perform them under any conditions."

THE WHITE COMPANY, *Cleveland*

# WHITE BUSSES

**FOURS and SIXES**



# Home-
## *a half hour sooner via Broad Street Subway*



WHEN the City of Philadelphia recently opened its new Broad Street Subway for revenue service, the northern limits of the City were virtually moved a half hour closer to the City Hall.

Commuters from this outlying section now reach their homes thirty minutes sooner by using this new subterranean avenue of transit.

Philadelphia's streets have been widened, by this surpassing facility, not by an actual increase in width, but through increased capacity to accommodate growing surface traffic requirements.

Westinghouse feels a pride in having supplied the 312 motors—64,000 horsepower, control equipment, switch panels, ventilating fans and battery-charging devices for the 150 cars that under the skillful and progressive Mitten Management are now saving many thousands of hours daily for Philadelphia's metropolitan population.

MEMBER AERA 1923

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of the United States and Foreign Countries

# Westinghouse

T 30206

# Electric Railway Journal

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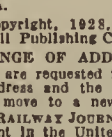
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November 3, 1928

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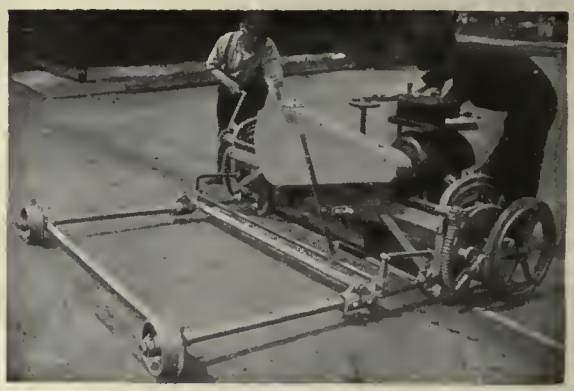
BETTER RAIL, BETTER TRANSPORTATION

# New Competition



Eureka Radial Rail Grinder

Steel-tired wheels on dirt roads couldn't compete with steel wheels on any old track; rubber tires on concrete roads can.



Vulcan Rail Grinder

That competition can be met only on track well maintained.



Reciprocating Track Grinder

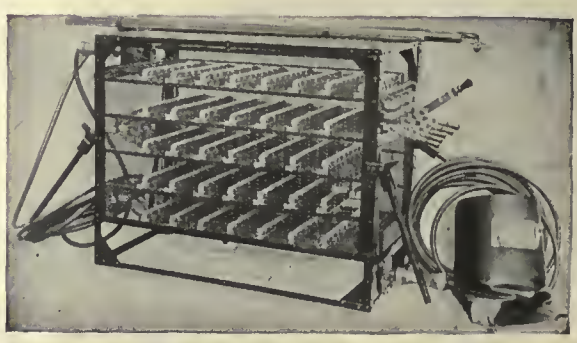
**Railway Track-work Co.**

3132-48 East Thompson Street, Philadelphia

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Ⓡ 2864



"Ajax" Electric Arc Welder

BETTER RAIL, BETTER TRANSPORTATION

# DOLLARS AND SENSE!

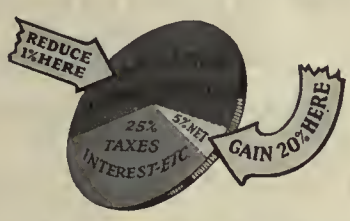



## Cincinnati, Hamilton & Dayton Spends $1,402,306 for Additions and Betterments

THE amount that the Cincinnati, Hamilton & Dayton spent on additions and betterments is highly significant. Some of the items were as follows: track construction and reconstruction, reconstruction of telephone and distribution system, construction and reconstruction of stations and miscellaneous building, eight new substations, new shops of the most modern kind, etc.

In the face of the economic conditions prevailing during 1927 this Ohio interurban made a fine showing—the gross revenues from operation of the entire property being nearly 5 per cent greater than in 1926.

The Cincinnati, Hamilton & Dayton appreciates the wisdom and sound business practice of *spending money to save money.*




It is sound business to spend money and better an operating result. The full importance of such a practice is demonstrated by the fact that a 1% saving in operating costs adds 20% to net profits.

# Spending Money to SAVE Money

THE relation between better operation and better income is very close—so important one to the other that the Cincinnati, Hamilton & Dayton Railway Company spent nearly two million dollars improving operating facilities to bring increased income.

The expected favorable result of this expenditure is explained above. Better operation through modernization is always a big step toward lower operating costs—and every penny saved there adds materially to "net" profits.

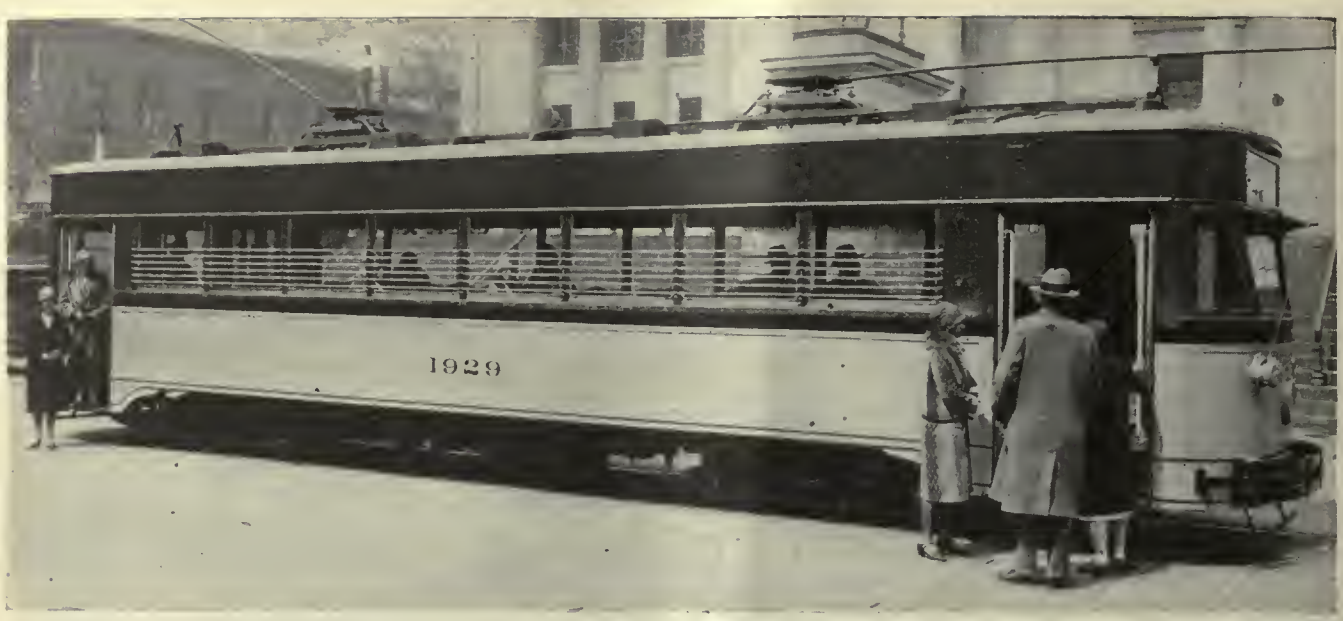
Naturally in such an extensive betterment program the use of quality materials of established reputation and proved longevity is a foregone conclusion. Here O-B materials played their part, as they are doing on up-to-date electric railway properties the country over.

**Ohio Brass Company, Mansfield, Ohio**
Canadian Ohio Brass Co., Limited
Niagara Falls, Canada
956G

# Ohio Brass Co.

PORCELAIN INSULATORS
LINE MATERIALS
RAIL BONDS
CAR EQUIPMENT
MINING MATERIALS
VALVES

NEW YORK CHICAGO PHILADELPHIA PITTSBURGH ATLANTA CLEVELAND SAN FRANCISCO LOS ANGELES




# *Racy Cars Should Be Racey Cars*

When you have given your car a streamline body . . . fitted it with comfortable seats . . . powered it with high speed motors . . . to simulate the automobile in appearance and fleetness . . . don't neglect another important factor that will help it keep pace with automotive transportation.

The Westinghouse Variable Load Brake—by insuring uniformly short stops throughout the range of car loading—permits faster schedules and a general speeding up of transportation service.

The Westinghouse Variable Load Brake is an attachment for use with straight air or semi-automatic equipments by means of which the brake cylinder pressure is automatically adjusted as the car weight changes, to provide the same retarding effect throughout the range of passenger loading.

WESTINGHOUSE TRACTION BRAKE CO.
General Office and Works, Wilmerding, Pa.

# WESTINGHOUSE TRACTION BRAKES

WHERE a machine can do a task better and at less expense, there is no longer any reason to employ labor for that task.

Where a modern manufactured product fills a need better and cheaper than an old fashioned "stand-by," there is no excuse to keep on using the "stand-by."

One of the best examples of modernization is the application of mass production methods to paved track construction, and the use of steel Twin Ties.

And the indirect result is greater patronage because cars run smoothly, always, over modern track.

THE INTERNATIONAL STEEL TIE CO.
CLEVELAND, OHIO

STEEL TWIN TIE TRACK
THE BASE OF MODERNIZATION

# What Do You Ask of a Wheel?

*Strength*—Davis "One-Wear" Steel Wheels have an unequalled resistance to impact. They are the utmost you can do for safety.

*Light Weight*—Because Davis "One-Wear" Wheels are made of special heat-treated steel, they can be made lighter while retaining full strength.

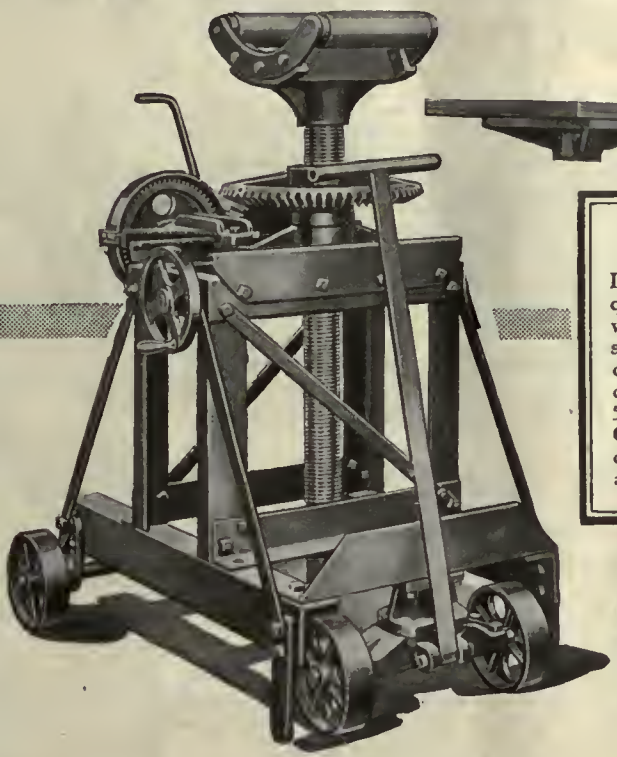
*Low Cost*—Because their first cost is their final cost, the economies of Davis "One-Wear" Steel

Wheels roll up as the years roll by.

**AMERICAN STEEL FOUNDRIES**

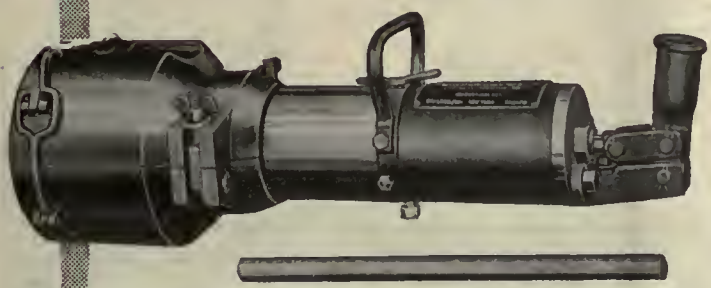
NEW YORK CHICAGO ST. LOUIS

# THIS EQUIPMENT SPEEDS UP SHOP WORK!



### *Peerless Pit Jack*

Designed for work of every character required in the street railway pit. Geared wheel and screw type, combining absolute safety with fine adjustment and two-speed operation. The top has a minimum height of 3 feet 6 inches and a maximum raise to 5 feet 10 inches, measured from the floor. Cradle top or flat top interchangeable. Made of heavy steel angles and allows for side adjustment of 10 inches.



### *Peerless Pinion Puller*

A portable machine for the easy and rapid removal of pinions from armature shafts without removing the latter from the motor. Ample power, small size. Won't damage shafts, bearings, housings or pinions.




### *Keystone Sand Drier*

A heavy cast iron heater surrounded by a sheet iron hopper which rests on a perforated ring. The wet sand is shoveled into the hopper against the heater, and as it dries, runs out through the perforated ring at the bottom. Heaters will burn hard or soft coal or wood and can be fitted for gas.

Home office and plant at 17th & Cambria Sts., PHILADELPHIA; District office at 111 N. Canal St., CHICAGO; 50 Church St., NEW YORK; Bessemer Bldg., Pittsburgh; 88 Broad St., Boston; General Motors Bldg., Detroit; 316 N. Washington Ave., Scranton; Canadian Agents, Lyman Tube & Supply Company, Ltd., Montreal, Toronto, Vancouver.

## ELECTRIC SERVICE SUPPLIES CO.

MANUFACTURER OF RAILWAY, POWER AND INDUSTRIAL ELECTRICAL MATERIAL

# COMPLETELY FRAMED



## SPEEPS UP CONSTRUCTION

***International*** Pine Poles are framed completely before treatment; never after treatment.

A corps of experienced pole framers is maintained at each plant so that poles in any quantity or size can without delay be framed to conform to the user's specifications.

Regardless of how complex the framing stipulations may be, ***International*** Poles reach destinations ready to go into the hole. This saves to ***International*** patrons all extra handling and framing expense either at the patron's concentration yards or in the field.

Poles ready for installation certainly speed up construction and reduce costs.

**International Creosoting & Construction Co.**

General Office: Galveston, Texas

Plants: Beaumont — Texarkana — Galveston

A section of the framing yard at the Texarkana Plant.



Distributed by Graybar Electric Company

A section of the framing yard at the Beaumont Plant.

# International Creosoted Yellow Pine Poles

# VERSARE

*Highway Units*

## Montreal Tramways Reorders

**The present fleet of Versares so satisfactorily meets every transportation requirement that Montreal Tramways Company has ordered more.**





The success of Versare Transportation Units in enlarging the service of electric traction companies in Boston, Cleveland, Montreal, Albany, Providence, New York and elsewhere can be duplicated in practically every other city.

Fleets of Versare 6 wheel Units, operating under the direction of well known traction companies, demonstrate their superiority over familiar types of buses and coaches.



Versares are the allies of electric railways in meeting the requirements of mass transportation.

The Versare radically differs from other vehicles in design, and construction. It is not a bus revamped! It is not an adaptation of a coach! The Versare Transportation Unit is the closest approach to the most successful type of modern electric street cars, with all the advantages of mobility and ease of operation of the automobile.

The Versare comfortably carries 37 seated passengers and 37 standees. Has ample head, leg room and wide aisle. Permits circulating load—front entrance and side exit doors speed up running time.



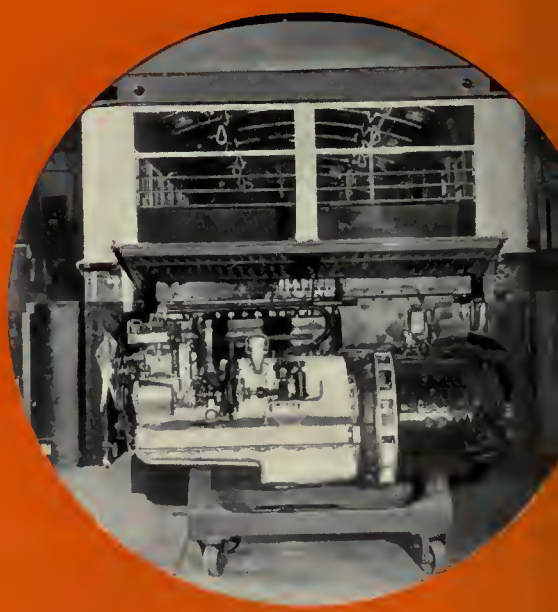


# VERSARE



In construction the Versare is not approached by any other vehicle. Truss girder construction—same as skyscrapers, bridges and dirigibles—gives great strength and rigidity. Girders, angles and castings are made of Duralumin. Sectionalized body framework permits quick replacement in case of injury, without dismantling body.

The enormous mileage covered by Versare units without any maintenance requirements speaks volumes for its rigid construction.



The Versare is powered by a 125 hp. gasoline engine with two 33 hp. motors, located in rear and very accessible. Absence of fumes, noise and vibration; easy control; air-brakes; quick pick-up, speed, hill-climbing ability under full load are a few features of this vehicle. Every electric railway official should give the Versare Highway Transportation Unit careful study.






# Echoes of the CONVENTION

Very few of those attending the 1928 Convention could approximate the extent of treadle-ization. Mr. A thought there might be as many as 200 treadles while Mr. B felt there must be 75,000.

The exact number of treadles in service at that time was 6178.

Mr. P. J. Connors, Supt. of Shops at Newark, N. J., Public Service Co-ordinated Transport thought there were 6200, while Mr. H. B. McKelvey, Sales Representative of the Twin Coach Co., Kent, Ohio, said there were 6159.

## NATIONAL PNEUMATIC COMPANY

LOOK FOR THIS MARK

"STANDARD" STEEL PARTS

# Vital Items of Equipment

A car that is equipped with "Standard" Steel Wheels, Axles and Armature Shafts is serving the public with the maximum of safety, speed and comfort and paying the operator a just return upon his wisdom in selecting "Standard" quality, for such vital items of equipment.

**STANDARD STEEL WORKS COMPANY**

PHILADELPHIA, PA.

BRANCH OFFICES:

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MEXICO CITY

WORKS: BURNHAM, PA.

# The threefold return from an investment in Modern Cars

## Increased Revenue

—is the natural result wherever riding comfort and attractive appearances are made a part of modern car design.

## Increased Speed

—through faster acceleration and breaking means greater operating capacity for each car, better service or a possible reduction in rolling stock investment—an advantage either way.

## Lower Operating Costs

—are inevitable with Light weight cars and one-man operation. This saving alone is paying for the investment in modern cars we have built.

CUMMINGS CAR AND COACH CO.
111 W. MONROE ST.
CHICAGO, ILL.

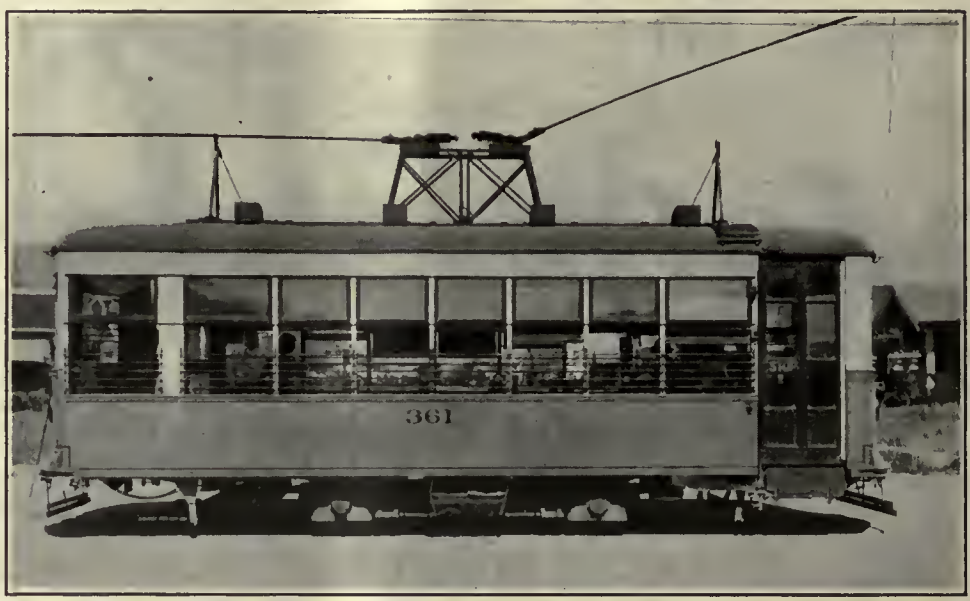
Nothing is apt to cost so much as a bearing that cost so little

*You men who plan, build, use or pay for machines of any kind, remember this: It costs more to replace a poor bearing than to buy the best one that SKF ever produced. AND SKF ANTI-FRICTION BEARINGS ARE THE HIGHEST PRICED IN THE WORLD.*

SKF Puts the Right Bearing in the Right Place

ANOTHER APPLICATION OF SKF BEARINGS
ON THE

## Street Railways of America




## *Three Years of Operating Economy with SKF Bearings on Journals and Motors*

MORE than three years in regular service . . . . with easy riding and low maintenance. That is the record of SKF Bearings on the journals and motors of this car. The bearings never require any adjustments and housings are designed to effectively exclude all dust, grit and moisture. Just how successful SKF have been is borne out by the Master Mechanic's statement:—

"It (the car) takes rough and uneven tracks with less oscillation than other cars of the same type and . . . . the riding and running qualities of car No. 361 are superior to other single truck safety cars we are operating. That's why trainmen show considerable preference for this car and passengers are assured a comfortable ride."

SKF INDUSTRIES, INCORPORATED
40 East 34th Street, New York, N. Y.

2136

SKF

THE HIGHEST PRICED BEARINGS IN THE WORLD



# Where Do the Cars Fit In ?

THEY don't—unless they're new—up-to-date cars—cars built to meet the modern trend in transportation—cars that are built today to *stay new in* appeal for the rider of tomorrow.

You're selling much more than rides, otherwise you might just as well nail a lot of boxes to a flat car, pitch a tent over the top and call it a day.

Yesterday's luxuries are today's necessities, and your passenger of today accepts no substitutes.

Buy Cincinnati Cars—now. They're fast—safe (made doubly so by the Cincinnati Duplex Air Magnetic Brake) comfortable —*they appeal.* And in that appeal is the security of future earnings, the assurance that because you serve the public well today, the public will use your services as the years roll by.

Let us tell you more about Cincinnati Cars, and *why* they *fit in!*

CINCINNATI CAR COMPANY
CINCINNATI, OHIO

**CINCINNATI BALANCED LIGHTWEIGHT CARS**

# American Steel and Wire Company.

## A Bond of the Past



## -of the Present -and of the Future

Various types of bonds have been developed to simplify installation without sacrificing performance, but none have met with greater favor than the Pin Terminal Rail Bond.

No cumbersome machinery or special tools are required to install this type of bond. A few blows from a hammer and the rail is efficiently bonded:—as simple as driving a nail. The only requisite for a lasting contact is a clean hole of proper size.

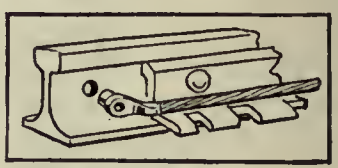
For the future:—high electrical conductivity and simplicity of application, assure extension of the use of Pin Terminal Rail Bonds.



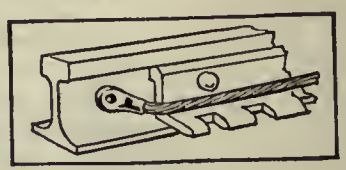
*The pin and taper punch*



*The bond*



*The bond in position for application. Drive the taper punch through, then the permanent pin.*



*The bond installed. What can be easier?*

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DENVER..First National Bank Bldg.
SALT LAKE CITY Walker Bk. Bldg.
*United States Steel Products Co

# At 5 o'clock

## *All Paths Lead to the Electric Railway*

. . . Five o'clock and millions of workers "call it a day." From factory, mill and office they come, each intent on getting home—and all depending on the electric railway to get them there.

. . . That the electric railway so seldom fails is a tribute to two things—efficient management and dependable equipment.

. . . As makers of the Gary Wrought Steel Wheel, the Illinois Steel Company is proud of its contribution to the latter factor; for while it is the *coach* of an electric railway that carries the passengers, it is the *wheels* that carry the coach.

. . . Gary Wheels embody the inherent safety of wrought steel, the dependability of a homogeneous structure, the protection of strictly modern manufacturing facilities *plus* an uncompromising system of inspection under which only a perfect product reaches the customer.

*Our wheel engineers are ready to serve you.*

**Illinois Steel Company**
General Offices:
208 South La Salle Street
Chicago, Illinois



# *A complete change from manual to automatic*

In 1924, the Sacramento Northern Railway Company equipped three substations with G-E automatic control. The reliability and economy of these three stations, demonstrated for four years, has prompted this company to equip its ten remaining manual substations with G-E automatic control.

This is but one of the instances in which operating companies have been convinced that it pays to use G-E automatic equipment to supply power to their lines.



130-12

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

# Electric Railway Journal

*Consolidation of Street Railway Journal and Electric Railway Review*

*McGraw-Hill Publishing Co., Inc.*
JAMES H. MCGRAW, *President*

CHARLES GORDON, *Editor*

LOUIS F. STOLL, *General Manager*

*Volume 72* New York, Saturday, November 3, 1928 *Number 18*

## Can the Public Understand the Facts?

IN THE Omaha newspapers last week there appeared full-page statements by the Omaha & Council Bluffs Street Railway outlining the company's position with reference to its toll bridge which links the two cities. Agitation for a free bridge is not a new thing in Omaha or in Council Bluffs, but its injection into the franchise negotiations can be credited largely to Senator Howell of Nebraska, who apparently would seize what appears to be a golden opportunity to wrest political advantage from an already difficult situation.

In President Shannahan's explanation of the intricate details of the bridge ownership by the Council Bluffs company and its leasing by the Omaha company, the complete story of the bridge lease, the financial set-up of the Council Bluffs company, the obligations of the Omaha company, the financial service performed by the toll bridge for both cities, and the effect upon Omaha and Council Bluffs of a competing non-toll bridge are clearly detailed. It is very frankly the intent of this message to enlist the sympathetic comprehension and support of the citizens of both cities in finding a satisfactory solution to a situation which is in no wise the creation of the present management, yet threatens now to jeopardize the granting of a new street railway franchise without which the Omaha & Council Bluffs Street Railway cannot continue to render efficient transportation service.

Threatened more or less seriously with a proposal by some citizens that Omaha and Council Bluffs co-operate to build a free bridge, the street railway officials are very wisely taking the public into their confidence, openly publishing the facts in the case, and asking for a square deal. The clear-cut, frank explanation of the position of the company and its attitude must commend it to every thinking citizen. The Omaha company has expressed clearly its willingness to co-operate to the fullest extent in effecting an arrangement which will be satisfactory to the public it serves. "We trust the public," declared Mr. Shannahan. "While we are aware of its desire for a non-toll bridge, we also have confidence in the public's intention to be fair with us. We believe that the public will be willing to pay for the bridge on its fair and just value. We likewise believe that the public will be willing to have this value determined in an impartial manner."

Here again is an expression of confidence in the attitude of the American public. Whether or not the public in Omaha will in this instance deal fairly with its railway, only time alone will tell. Usually the man on the street has been handicapped by lack of facts. Here, however, he has the facts; clearly, openly and succinctly stated. The question is not one of the fairness of the public. It is instead a question of whether the public is able and willing to deal with facts and to detect in the glittering promises of those who seek to strike a popular chord by promising something for nothing, the hidden motive of personal advancement at the taxpayer's expense.

## Co-ordinating Building Development with Transit Facilities

LITERARY license is the right of Deems Taylor. Still it came as a surprise to discover the editor of *Musical America* and the composer of the music of "The King's Henchman" writing for *Vanity Fair* an article "The City That Died of Greatness." He is an alarmed New Yorker who discusses what the skyscrapers are doing to his home town. Imaginative artist that he is, Mr. Taylor closes by indicating that perhaps the best thing to do after all would be to wait ten years until New York is so hopelessly congested that no one can move at all. The population will then migrate in a body, and New York can be set aside by the government as a national park—the city that was so prosperous nobody could afford to buy real estate; that was such an ideal place of business, nobody could transact any business; the metropolis so greedy for population, it choked itself to death.

Mr. Taylor points out that however fast new subways may be built, the skyscrapers outstrip them so that a new line is jammed beyond its theoretical capacity almost as soon as it is opened. This, of course, is not a new observation. Best of all, Mr. Taylor takes a shot at the Babbittry which always supplies the optimistic note by proclaiming that a way will be found to solve this and other problems arising from the magical development of skyscraper districts such as that best or worst evidenced in New York, but with its counterpart in nearly every other city of first magnitude today. But the thing which Mr. Taylor fails to point out, and it was not to be expected that he would do so, is that no one has taken the trouble to find the basic economic laws that lie at the root of the whole traffic and transportation evil.

That the problem is primarily an economic one is almost self-evident. No one will dispute the possibility of providing sufficient transit facilities if the necessary money were available. And the sad part of the whole situation is that this lack of funds is more apparent than real. It is not attributable to lack of resources, but to failure to put the transit load where it belongs. Take for example the very problem presented by the transportation requirements of the skyscrapers referred to by Mr. Taylor. Why limit their height? In order that population density may be held down to the capacity of subways built with public funds? Let's examine that for a moment.

Why impose an artificial restriction on the development of property through an arbitrary building height

limit when the same result can be accomplished with far better economic balance through permitting natural economic laws to exert their influence? An arbitrary building limit tends to hold down property value through limitation in the allowable intensity of use of the land upon which the building stands. There is nothing the matter with this as a point of equity, if it becomes necessary to the welfare of the community. But what is the proper allowable building height limit? There the controversy starts, and there the policy of limiting building heights breaks down at its weakest point. Would not the same ultimate result be achieved without a building restriction, by assessing as a property benefit the cost of providing sufficient rapid transit capacity, whether the requirement be one level, two levels or even more? If the construction cost of providing sufficient transit facilities to serve these modern skyscrapers were put where it belongs—on the property which makes these facilities necessary—would not this financial load serve as an automatic check on the height of buildings that would be erected? And is this method not preferable to that of arbitrarily limiting building heights, since it permits the free action of natural economic forces and thereby permits a proper economic balance to be reached between building heights and transit facilities?

Obviously, the subject is too involved to be exhaustively presented here. But engineers in every large city that have given serious thought to the fundamentals of rapid transit economics are almost a unit in agreeing that the special assessment principle is the only sound method of financing rapid transit. It is doubtful, however, if there is any general conception among those who have not studied the subject thoroughly, of how far-reaching would be the effect of the application of this principle in relieving many phases of the transit problem that clamor for solution in every metropolitan community.

To revert to Mr. Taylor, he sees the skyscraper as another proof of the fact that man's cleverness is generally far in advance of his intelligence; that his ingenuity in devising new instruments of civilization is by no means always accompanied by the resourcefulness or imagination needed to handle them intelligently. The quarrel is not with the skyscraper, but with the lack of vision displayed in co-ordinating building development with transit facilities.

## Under the Pressure of Necessity a Broader Vision Is Born

SOME few months ago the attention of those who follow the sophisticated pages of the *American Mercury* was called to the plight of "The Troubled Trolley." With gentle irony the author poked a little harmless fun at the ballyhoo and the seeming loud whistling within the local transportation industry to keep up its courage. But he failed to point out that the troubles of the trolley are merely surface reflexes of the terrific struggle of the modern American community itself, to avoid strangulation from a simultaneous overdose of skyscrapers and automobiles.

To the credit of the trolley may it be said there is every evidence today that leaders of thought in the industry are looking for the solution of their troubles, not so much to palliatives and expedients to give temporary relief, but to a broad understanding of the relation between transportation service and community development. In that they are endeavoring to serve not only their own best interests, but the interests of American communities, with the welfare of which their own destinies are inseparably linked.

No thinking man can read the article by President J. P. Barnes, printed elsewhere in this issue, without being struck by the breadth of the approach which is being made to the transportation and traffic question by those who see in this outstanding problem of the community, an opportunity for the transportation man to play his part as a public servant in the highest sense of that term. To those immersed in the routine of daily detail who may be inclined to scoff at this as merely ballyhoo may it be said that the program of fundamental research outlined by President Barnes is already much further under way than may perhaps be realized by those who have not followed closely the course of the association's activities during the past few years. Mr. Barnes gives the reader merely a glimpse of what is going on in the minds of the men who are thinking beyond the present and looking toward the future. But in that mere glimpse there is unmistakable evidence that the pressure of necessity is leading transportation men to more fundamental thinking and a broader vision.

## A Major Extension of Electrification

INTIMATIONS have not been lacking in the past that big things were in prospect on the Pennsylvania system in the realm of future electrification, but the public and the engineering fraternity were hardly prepared for a program of the magnitude indicated in the announcement made by the company on Thursday morning and outlined elsewhere in this issue. The extent of the work now authorized, covering more than 325 miles of line and 1,300 miles of track, and the fact that the single-phase system is to be used are the outstanding features of the announcement. The first of these makes the proposal the biggest of its kind so far to be attempted since the Milwaukee electrification. The second represents an extension of that form of propulsion used on the Pennsylvania's suburban lines operating out from Philadelphia as well as on the section of main line between Philadelphia and Wilmington, just recently completed.

Among the reasons given for the change is increase in track capacity through the more expeditious handling of trains. This is deeply significant. For passenger trains it means smoother and more comfortable operation and fewer switching movements. For freight trains it means higher speed, a most important gain in the case of perishable freight and one which under electric propulsion should open up new markets for fruitstuffs—a service that should gladden the South to the tips of the Florida Keys.

More than likely the intimate information about the project will soon be divulged and will be of the greatest interest to the railroad technician, both mechanical and electrical, but the facts so far made public are significant in the light of what they portend generally. In that the proposal is intended among many other things to anticipate the service requirements of a metropolitan community of 30,000,000 people extending into Pennsylvania Railroad territory from New York as far south as New Brunswick, it reflects the discounting of time by a management that has been unusually wide awake to its opportunities and obligations.

## Practical Planning for the Future

IT IS just as important for the management of every large business corporation to plan for the future as to carry on current operations. Community transportation is no exception to this rule. Fortunately, it is much easier to do this now than it was a few years ago, because the place of the bus is much better defined. The principles governing the determination of a proper fare are also more thoroughly understood. Experience has shown in the first place the necessity of co-ordinated service. In the second place, it has taught the need of a flexible fare—one which will change with the cost of producing the transportation.

On many properties the present is a period of readjustment, during which both of these matters can well be considered. The present, then, is pre-eminently the time for preparing for the future. An example of such constructive planning is shown by the San Antonio property, in an article in this issue. Before the advent of the bus this company's trolley lines gave both a city and suburban service on a flat fare, but left considerable areas within the city unserved. Then came the bus with its potential danger as a competitor but with great possibilities if co-ordinated with the electric car service. It was to the latter usage that it was applied in San Antonio, i.e., to supplement the local electric cars and also to give a special suburban express service. To carry out this plan some electric track was abandoned, and car operation was confined to the area within a 3-mile radius from the center of the business section. Within this district a flat fare is charged. The higher fares for the longer rides on the buses are collected on the zone system. This means that as the length of run increases with the growth of the city, the fare can keep pace with the longer rides given.

In too many cities in this country transportation has had a haphazard growth. Definite city planning, particularly as to transportation, has been almost unknown. As a result development and expansion have frequently brought an increasing burden in the form of rising costs, with no corresponding provision for added revenue. In a growing community there is a constant pressure for the extension of transportation lines, sometimes into comparatively thinly populated areas. The very flexibility of the bus, which constitutes perhaps its greatest advantage as a transportation tool, opens wide the door to this pressure for extensions to thin territory. Only through the establishment of broad policies which will anticipate the future as well as provide for the present, can there be assurance of orderly growth and permanent stability.

## Uniform Interpretation of Accidents Needed

WITH the increased traffic which our city streets are being called upon to handle there has developed, as was inevitable, a constantly increasing liability to accidents involving street cars, vehicles and pedestrians. Concurrently, these accidents have become more and more diversified in character—with more elements of the unusual entering into their happening.

Many companies are undertaking to keep extensive accident records, including the assigned causes, with a view to developing preventive measures from an analysis of these data. Much good work has been accomplished by this process. The interest and co-operation of platform men on many properties have been enlisted in the cause of safety. Electric railways have established a record that has earned the street car the right to be called the safest place on the street. But despite all of this, the hazards of constantly growing congestion and higher-powered motor cars demand still greater alertness and attention to accident prevention measures on the part of those charged with the management of public transportation systems.

Comparison of the performance of several electric railways of the same general characteristics and size offers a means of directing attention to the need for still further reducing accidents on some properties. But to accomplish this there is need for a more uniform plan of reporting and recording accident statistics. The fault does not lie with a lack of a standard classification for accidents. Such a classification, with fourteen main heads and many subheads, was adopted in 1916 at a joint meeting of the Claims and the Accountants' associations. But occurrences which would be considered accidents on some properties are not so designated on others. Furthermore, the determination of chargeable and non-chargeable accidents for the purpose of classification and record keeping is subject to wide variations in interpretation.

## "Wanted—A Horse Car"

"WANTED, a horse car of former days, with or without running gear, with clock and stove, if possible." Thus read an advertisement in the Oct. 6 issue of Electric Railway Journal. The purpose to which the old car, if acquired, is to be put was not disclosed, but a guess may be hazarded. As the running gear is not considered essential, it is evident that the car is not to be used for the transportation of passengers, or even for exhibition. The proposed purchaser is not inspired to preserve this relic in its pristine condition for the benefit of posterity. He is not a Henry Ford. For either of these purposes, wheels are essential. Evidently this chariot of former days is to be still for the remainder of its life, after the new owner comes into possession of it.

However, the latter part of the advertisement offers a clue to the purpose of the advertiser. "With clock and stove, if possible." These would not be needed unless the car is to be used as a habitation of some kind, though not necessarily one for human beings. Fancy can easily picture it mounted on sturdy posts, some distance from the residence of its owner, and used perhaps as a playhouse for his children or grandchildren. Then again, it would make an excellent watchman's shanty, and both the stove and clock would be useful. As a kennel or chicken house one might find reasons for the stove but would be at a loss to explain the specified clock.

Old cars are very well suited for such uses, as the timber of which they are constructed is usually of a very durable nature, the posts often being of oak. Many old electric cars still in operation could well be dedicated to a similar purpose. They have long outgrown their value in attracting traffic. They are too heavy to be operated economically. They are of a design too obsolete to warrant rebuilding. Their day has passed; their sun has set, and they should be replaced by more modern equipment. As was the practice with the horses of the old horse railway they can well be sent to the farm after they had outlived their usefulness. Let them end their life amid pastoral surroundings, still being serviceable as playrooms for children or as chicken houses. There they would be economically useful, but for passenger carrying service they are a decided liability.

# Expedients Have No Place in Solution of

# Modern Transportation Problems

*By J. P. Barnes*
President American Electric Railway Association

**A strong appeal for more fundamental thinking and a broadened conception of the problems of community transportation and traffic congestion is made by President Barnes in this article, which is based upon an address delivered before the Public Utilities Association of West Virginia**

TO CONSIDER the history of the development of mass transportation in the light of present-day conditions is to note a strong tenacity of purpose, a high degree of devotion to public duty, and a great courage in performance. Ours is an industry of enormous vitality. Were this not true, it would have been an utter impossibility for the street railways of the country to have survived the tremendous economic strain to which they have been subjected by the changed and changing conditions of modern times. The public carriers of people in the city streets have doggedly fought an up-hill fight and have in the main fulfilled their obligation to the public, though in many instances at the price of appalling sacrifices. In that fight they have not had the needed sympathetic understanding and co-operation from the public.



J. P. Barnes

Ours has been the problem of how to do, without new money and without the assistance of enlightened public support, the tremendous job of revision which has been and largely still is necessary to meet the shifting needs of a rapidly developing civilization. Beset by obstacles and lacking the very sinews of war in the form of adequate credit, with a fixed investment in fixed forms of physical facilities, our industry has maintained its integrity in the midst of a world economically and physically changing with greater rapidity than any earlier civilization has experienced. Change is the order of the day—change in habit, change in ideals. Novelty is popular and stability is no longer static, but is achieved only by continuous development. Automobiles, telephone, radio have so broadened man's horizon that the measuring sticks of a generation past are good today to measure nought but failures.

C. F. Kettering, vice-president of General Motors, said at the recent Cleveland convention that the business of the advertiser today is based upon keeping people dissatisfied with what they have. The cry of mankind today is for something better, something bigger, something different. The world has stepped on the accelerator and is going somewhere. Are we in the procession?

### Inertia Is a Powerful Force

It has been said that inertia plays a large part in governing human affairs. Physical inertia is the tendency of a body to continue in its state of rest or motion. The human mind is likewise subject to mental inertia which follows closely this same physical law. Inertia resists a change of direction as positively, if not as powerfully, as it resists change in speed. To correct an error in direction, however, it is not necessary to follow the heroic process of completely stopping one line of development and starting all over. When an adjustment becomes necessary, shouldering from one direction toward a more constructive direction often is the quickest and safest method of correction.

In our industry there has been little rest for the past decade or so, but it seems wise to wonder whether we have always moved in the right direction. Perhaps the most important change which is affecting the inertia of the public transportation industry is the increase which has taken place in the use of the private automobile. In the last ten years the number of private automobiles has increased from 35 to 170 per 1,000 of population—an increase of nearly fivefold in ten years. In the same period rides per capita on public transportation vehicles have remained practically constant. Surely all of these automobiles go somewhere and someone rides in them. Enormously more transportation is being used by the public year after year. The effect of inertia has been the increase in the use of the private automobile while the riding in public transportation vehicles remains prac-

tically constant. Our problem is one of diverting the direction of our development to coincide with changing public preference. We must get back into the line of advance.

### Broader Conception Needed

Transportation is more in demand today than ever. Transportation is our business. Yet we're marketing no more than formerly. We have fought to maintain our place on the public streets and in the public heart; we have fought to obtain a fare at least as large as that we had before the war. In neither battle have we been wholly successful. We enjoy no such freedom from physical interference as in the past. Measured by the 60 per cent increase of commodity prices the nickel of yesterday is 8 cents of today. Measured by the 120 per cent increase in labor costs, it is 11 cents of today. The demand for a 10-cent fare is not a demand for increase in fare, but for maintenance of fare.

We have seen the development of the automobile as a private transportation agency. We have seen this agency move toward and into the field of public transportation. Yet with the single exception of the automotive bus, which is after all merely one particular type of automobile, there has been no general adoption, and in fact no general discussion of adoption or adaptation, of these new agencies into the field of public transportation. It is true that a few of the most progressive street railways have with trepidation entered the field of taxicab operation. But, in the main, we have insisted upon the efficiency and sufficiency of the services hallowed in our minds by tradition and have not followed the public urge toward newer, faster and more convenient transportation by amplifying our basic service.

Our discussions of merchandising transportation have centered too much about the merchandising of the type of transportation we have been offering, and not enough about the changing or amplifying of local transportation service to meet the broader requirements of modern cities. We have tried to market tallow candles in a world which has learned to use electricity.

### Security of Industry Rests on Meeting Public Need

We have insisted upon the preservation of the integrity of our investment devoted to public transportation. In this we are justified if we render and continue to render a needed public service. If our service should ever cease to meet a public need our claim to co-operation and conservation of our physical assets would be vain. If, on the other hand, we found the security of our properties upon the principle of continued advance and improvement to meet changing conditions, then our effort to maintain the integrity of our assets will be successful to the extent that we meet the public need and win public approval and support. These things cannot be accomplished superficially or on the basis of expediency. We must think fundamentally, we must get to the basic economics of our problems, in order that we may anticipate successfully future trends and requirements.

One of the speakers at our recent convention, N. D. Cochran, editor-in-chief of the *Scripps-Howard News,* flung a fair challenge to us when he said, "Perhaps you've been trying to win a battle, not to solve a problem." Yes, we have battled—to hold our place. And in a measure Mr. Cochran is right in intimating that perhaps we have not fully understood the public's point of view in our attempt to improve the condition of our industry. But the problem is not simple nor single. Permanent improvement in transit conditions is dependent upon the interest and co-operation of many groups in the modern community which have as yet failed to grasp the causes and the nature of the malady that is producing acute congestion of traffic and impotence on the part of public transportation. A thorough organic examination is needed to prescribe a permanent cure. Temporary remedies fail to reach the root of the trouble.

Take the single difficulty of traffic congestion, for example. The enormously increased use of the automobile has brought with it the conspicuous increase in congestion in our city streets. This is attributable to use of existing highways for a new and essentially modern vehicle in the same way and under the same general plan as for the older, slower and much smaller number of vehicles of the past generation. Present street space may have been entirely adequate for movement and storage of the buggy and wagon of the past generation. This was due entirely to the smaller population in the streets. Three and four-story buildings were the rule, for the simple reason that people would not climb more than two or three flights of stairs. Streets were accordingly designed for the accommodation of traffic based upon the population of such buildings. But with the development of vertical transportation through the perfection of the elevator came a tenfold multiplication of population within a given area, and with it a straining of the facilities for horizontal transportation. Traffic has become a problem in three dimensions, and, for those who care to follow Mr. Einstein, its effect upon the fourth dimension, time, can be readily observed in the course of an attempt to pilot a vehicle through the high building section of any American city.

### Traffic Problem Not Faced Squarely

Inertia on the part of the public has operated here, and there has been little effective effort to meet the changed conditions. Branch stores, branch banks and neighborhood shopping centers have spread rapidly with little or no recognition by business men or by the public that these things have been largely necessitated by outgrown downtown streets or the out-of-date practice of wasting, instead of using, the capacity of downtown streets. This is no wail against the so-called parking evil. Even a moron knows that automobiles cannot stand and run upon the same space simultaneously. The choice is deliberate and the merchant can blame no one but himself, if his insistence upon the parking privilege sends more customers to outlying centers than it brings to his own door.

My point is that the traffic and transportation situation is affecting the fundamental character of city growth, of population distribution, of business development and social habits. (I do not say whether for better or for worse.) It is a distinct credit to our industry and our association that our leaders of thought have the vision to see beyond the limits of immediate operating problems to the greater and broader factors which are vitally important, not alone to transportation men but to every constructive agency in modern cities. We are trying to win a battle to conserve our investments. But we also are endeavoring to take a leading part in solving a vital community problem and in fulfilling the broadest possible interpretation of public service. The transportation problem before American cities today is not a problem of one agency or one group, but of all the people. It is obvious that whatever measures will expedite the movement of street cars will expedite the movement of all

traffic, for street cars cannot move faster than vehicular traffic in busy streets, nor can vehicular traffic move faster than street cars.

### Association Undertaking Broad Study of Fundamentals

Last year a committee of the American Electric Railway Association, appointed to study "street traffic and mass transportation," found from its preliminary discussion the need for a broader study than its original assignment, and that committee is now engaged in a broad investigation of the fundamental subject of "street traffic economics."

This represents a transition from the superficial study of symptoms to the fundamental study of underlying causes. Constructive and effective treatment of transportation and traffic congestion demands the discovery, interpretation and intelligent application of the basic economic principles which govern the use of available street facilities. We must construct a suitable foundation before we can erect a proper and stable superstructure.

Additional committees are being appointed this year for a study of the economics of fare structure and for an analysis of transportation research. The organization of economic studies in other fields directly affecting the broad problem of community transportation is under discussion. As an association and an industry today we are endeavoring to cut through superficial expediencies in an attempt to find fundamental remedies for present-day difficulties. Engaged as we are, in a business for which there is a continued and continuing need, we have too often sought the easy and temporary solution, and too seldom insisted upon the fundamental remedy. We are engaged in the business of public transportation, and the type of transportation demanded has changed and is changing from day to day. We must follow that change if we would build our business upon that permanence which is continuous improvement.

### Need to Improve Load Factor

Turn for a moment to the topic of one of this year's new committees, that on "fare structure." May I suggest that in all parallel public utilities, in the electric power, light, gas, telephone and telegraph services, there has been a recognition in the rate structures of the importance to those industries of satisfactory load factor. In every one of these industries off-peak service is obtainable at such rates as are calculated to attract additional volume of business and thereby improve the load factor and the gross revenues of the business.

How many fundamental attempts have been made to improve the load factor of the public transportation industry? The weekly pass, the daily pass, the nickel card, the reduced-rate ticket, have all been tried, usually in some combination dictated by expediency or a compromise in public hearing rather than by any basic study of the economics involved. We are almost wholly ignorant of the effect upon load factor, and hence upon gross earnings, of the many possible modifications of rate structure. We are almost wholly ignorant of the effect upon load factor, of varying or alternative forms of service at various hours of the day, or of variations in the public's use of our service.

We do not see deeply into the psychology of the traveling public. We can guess, but we cannot demonstrate the considerations which urge vast numbers of individuals to use a private vehicle at greater expense, and in some respects at greater inconvenience to themselves than would be occasioned even by our present services. We need more of the psychology of the small boy who, when asked how he succeeded in finding the lost horse, said, "Why, I just thought what I would do and where I would go if I were a horse, and I did, and went, and there he was." We must get at the ruling motives which determine the character of transportation chosen by the public of today. We must put ourselves in a position to offer that type of transportation which the public wants. This is a problem of research, if you please. It is a problem of sales psychology. It involves the study of a mental attitude whose self-analysis and self-expression is neither candid nor correct.

All these things, in one form or another, have been expressed in the addresses, articles and committee reports presented to the industry in the last few years. The 47th convention of the American Electric Railway Association at Cleveland in September was a high spot in the history of the association and the industry, not because it was the largest convention ever held, but because in the course of its meetings there were expressed more conclusions based on courageous, independent and fundamental thought than in any other similar meeting of the association.

### Must Get Rid of Inhibitions

What I am trying to say is that our association and the individual companies engaged in the public transportation business must rid themselves of those inhibitions which are based upon precedent, habit or inertia. We must take inspiration from our potential customers who are today our competitors. We must step on the gas and go somewhere. But we must know where we are headed. We must base our program firmly on the fundamentals of public transportation. We must study and understand the economics which underlie the growth, development, habits and movements of the modern community. Everything, in short, which bears directly or indirectly upon the public transportation of a community must be weighed, analyzed, and properly fitted into the structure of the public transportation business, if that business is to continue and is to render a maximum of public service.

We must view the problem in perspective. We must regard as the tools of our trade every vehicle which rolls, or slides, or can be pushed or pulled, or driven, on the surface, under the surface, or above the surface. And, we must fit these various elements into the composite public transportation system, which will serve, as nearly as may be, the entire public transportation requirement of the modern community, with maximum public convenience, with minimum expense, and with a true spirit of public service. This accomplished, public recognition and public reward will surely follow.

Toward this program of fundamental thinking the industry has for the past several years been steadily progressing. To this program of fundamental thinking it stands today committed. It is no over-night or week-end program. Earnest, untiring, patient and undiscouraged effort must, and will, be brought to its accomplishment.

It is said that the three hardest words of the English language to pronounce are "I was wrong." These words we will learn to pronounce whenever we find ourselves to have been in the wrong. An error admitted is half corrected. By the correction of errors, by the comprehension of fundamentals and by the courageous application of ideals, we propose, as an industry, to push forward toward the fulfillment of our inherited destiny.

# *San Antonio*

# Plans for the Future

## as Well as for the Present



Houston Street is one of the principal business thoroughfares of San Antonio

**Electric cars supply transportation for the greater part of the area 3 miles from the business center. Buses furnish all service beyond this limit. The company has developed its system so as to be in a position to provide for future expansion of the community which it serves**

SAN ANTONIO occupies an area 6 miles square in extent, with its business district practically at the center of this rectangle. With the addition of the suburbs, which also must be served by local transportation, the actual district involved is approximately 65 square miles. The population of this entire area is about 265,000 inhabitants. Home sites are relatively cheap and practically every family lives in a single house. Even in sections where people of moderate means are living, the lots are comparatively large. There is only one apartment house in the city, and it has 28 apartments. The climate is almost ideal for automobiles. These facts place a handicap on public transportation systems in that more lines of public transportation are required to cover the city, and less frequent service on each line is justifiable.

The manner in which this problem was approached and solved by the Public Service Company, the operating company in San Antonio, is told in its Coffin prize brief for 1928. The solution is notable because of its comprehensiveness. It involved the adoption of a system of fares which would not only be satisfactory at the time but which would remain so in the future with the probable expansion of the city in area and population. It comprised changes in car routing and an application of the bus to give a necessary supplementary but not competitive service. It included provisions by which extensions of bus and car service could be made in the future without material change in the existing arrangement. The statements in the brief are summarized in what follows.

### Combines Electric, Gas and Railway Property

The Public Service Company in San Antonio operates the gas and electric utilities also. So far as the transportation department is concerned, this has been a mixed blessing. It has enabled the transportation department to continue in business for a longer time without drastic action, and the public good will brought about by efficient service in the gas and electric departments have been of help to the railway. On the other hand, transportation policies have had to be determined for the good of the company as a whole, and only the most conservative methods could be used. It has therefore taken the railway longer to accomplish results than might have been possible if more drastic action had been open to the transportation department.

The transportation policy is based on a principle that applies in all merchandising, i.e., that to make a sale the article must not only be of value to the customer but of greater value than similar articles that can be obtained elsewhere. It must also be convenient for the customer to obtain the article. In the company's study of its own situation it has been gratifying to find that in most cases the actual desires of the public for transportation are best served by the most economical practice. Thus the principal desire of patrons of public transportation probably is to save time. It is true that comfort and safety are also essential, but as the length of a ride in urban transportation is relatively short, comfort may be given second place, and as safety has become accepted as an axiom in public transportation, it may not be made a

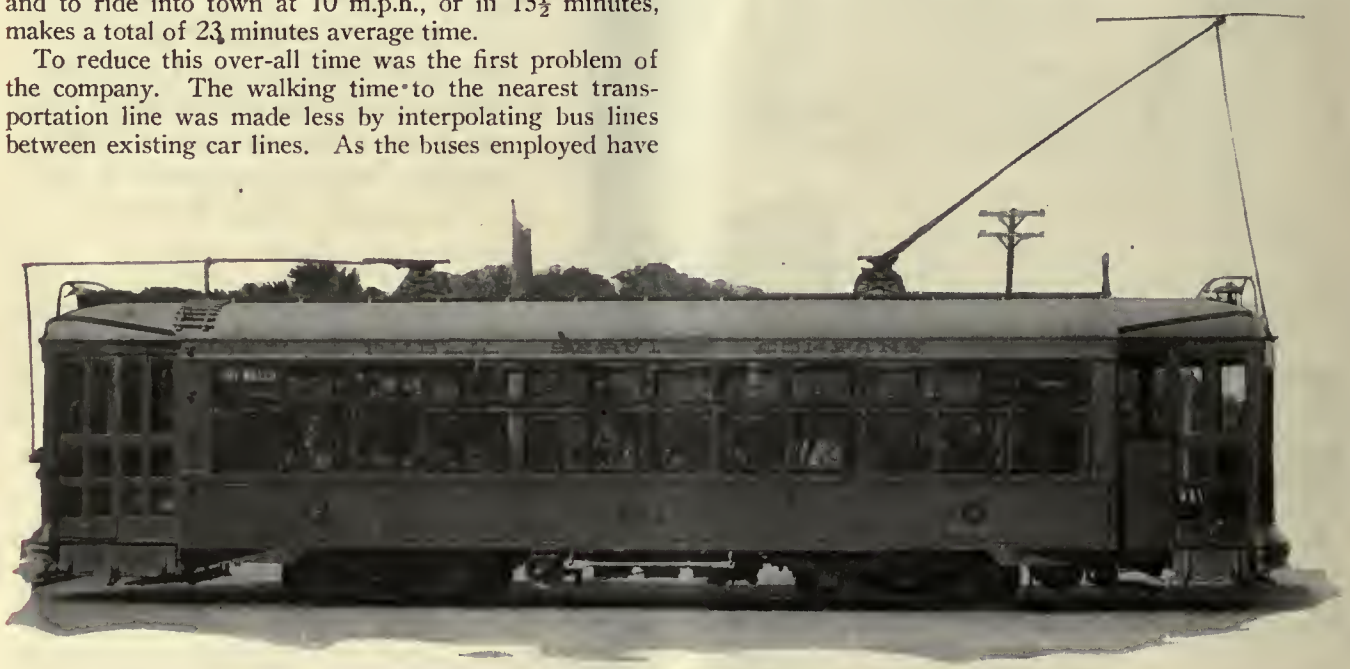
paramount thought because it may be taken for granted.

An analysis of the time required by a patron in his use of public transportation may be divided into three parts: that required in going to and from a transportation route, the time spent in waiting for a vehicle, and the time spent in transit. Each of these receive attention in San Antonio, with the object of making the total elapsed time for individuals between their homes and the downtown section on the average less than that which would be required if the same patrons used private automobiles between these points. For instance, the car lines in San Antonio, at a distance of 2¾ miles from the business center, average 0.88 mile apart, and the average walk to the nearest route from the residences in this section is approximately a quarter of a mile, requiring about four minutes. To this should be added the average time required to wait for a street car, or say 2½ minutes, and to ride into town at 10 m.p.h., or in 15½ minutes, makes a total of 23 minutes average time.

To reduce this over-all time was the first problem of the company. The walking time to the nearest transportation line was made less by interpolating bus lines between existing car lines. As the buses employed have less capacity than the cars, and consequently require fewer stops, a faster operating speed was possible.

The second item, that required in waiting for public transportation vehicles, is dependent upon the headways, the reliability with which the schedule is maintained, and the knowledge had of the schedule by those using the transportation provided. Headways in practice are dependent upon the volume of traffic and the size of the vehicle used. Where there is sufficient traffic, even large cars may be scheduled on such close headways that there will always be a car in sight, but where the business is relatively light it is desirable to use smaller units with more frequent headways. In either case the service given is unsatisfactory unless there is the most exact adherence to schedule. It is to this point that the San Antonio Public Service Company devoted a great deal of attention. In fact, to those who think that the "car in sight" basis of operation is necessary to compete successfully with private automobiles, it will be a revelation to learn the extent to which the public in San Antonio will use a service with relatively long headways where it knows the schedules and has found by experience that the schedules are maintained with clock-like precision.

The third item—time required in transit—is affected by several factors. They include the distance traveled, the conditions of the track, the equipment used, the number of people carried and stops made, the schedule speed and the ability of the crew to maintain the schedules. Each of these has its angle of approach. The route should be as direct as possible. Roundabout routings raise a greater psychological objection in the minds of passengers than the actual loss of time, because the time thus lost becomes exaggerated in their minds. Track well maintained not only adds to the comfort of the ride and is more economical in energy used and in cost of maintainence, but it permits faster schedule speed. New equipment should be selected and old equipment improved on the basis of its ability to accelerate rapidly and give rapid braking, because in city service with frequent stops, good acceleration and braking are most important factors of good running speed. In addition, good acceleration is needful in competition for street space, and good braking is essential in the matter of accident prevention.



**Latest type of street car in use in San Antonio**

The number of passengers carried on a given trip also usually has a close relation to the number of stops required. While it is possible to carry some standing passengers without seriously increasing the time of passenger interchange, when aisles become congested with standing passengers, the time taken for stops is out of proportion to the additional number of passengers carried.

Running time can often also be appreciably reduced by the establishment of an express service, supplementing a local service.

### Comfort and Safety Also Considered

The factor in transportation above mentioned, coming next to speed, is comfort. There are many ways of contributing to this end, but the outstanding desire of the passenger is for a seat. This is especially true of off-peak passengers, and the desire for a seat increases with the length of the ride. Fortunately for transportation companies, however, this desire is not uppermost during peak hours, when it is economically impossible for an

TABLE I—FARE STATISTICS AND RUNNING TIME SAN ANTONIO

| | Central Zone — Street Car | Central Zone — Bus | Second Zone Bus | Third Zone Bus | Fourth Zone Bus |
|---|---|---|---|---|---|
| Distance of outside limit of route from business center, miles | 3 | 3 | 1½ | 1½ | .... |
| Running time, minutes | 20 | 15 | 20 | 25 | 30 |
| Fares, cents | | | | | |
| Cash | 10 | 10 | 15 | 20 | 25 |
| Tickets | 3 for 25 | 3 for 25 | 5 for 50 | 5 for 75 | 5 for $1 |
| With 25c. weekly pass. | 5 | 5 | 7 | 10 | 15 |
| Average per seated passenger | 6.5 | 6.5 | 9.3 | 12.7 | 17.9 |
| Fares, cents per mile: | | | | | |
| Cash | 3.33<br>2.67 w.t. | 3.33<br>2.67 w.t. | 3.33 | 3.33 | 3.33 |
| Tickets | 2.78<br>2.22 w.t. | 2.78<br>2.22 w.t. | 2.22 | 2.50 | 2.67 |
| With 25c. weekly pass. | 2.33<br>1.87 w.t. | 2.33<br>1.87 w.t. | 2.00 | 2.00 | 2.27 |

Central zone bus fares, as listed above, apply also to rides within any zone; for each additional zone 5 cents extra is charged, i.e., the fare from any zone to the next zone may be paid by 15 cents cash or by a three for 25-cent token, plus 5 cents, or by one five for 50-cent ticket. In the same way the fare through three zones, or say zone 2 to zone 4, may be paid by 20 cents cash or a three for 25-cent token plus 10 cents or by one five for 75-cent ticket.
w.t. = with transfer.

electric railway to give a seat to every passenger. However, the fact should not be overlooked that many automobile riders do not use public transportation at any time because of the usually crowded condition in cars at rush hours. Hence, a high standard of service in this respect during peak hours should be adopted, and of greater importance is the maintenance of schedules to provide an even distribution of loads in the cars that are operated.

Safety, the third item mentioned, is one of the chief sales points with the public in the use of public transportation. Any doubt on this subject will be dispelled when the reluctance with which most people consider the use of air transport is considered. Yet in competition with private automobiles, the acknowledged safety of public transport does not seem to count for so much because everyone feels competent of his own ability to drive an automobile with an equal degree of safety. Nevertheless, the safety of car riding is a sales point which should be continuously emphasized by railways.

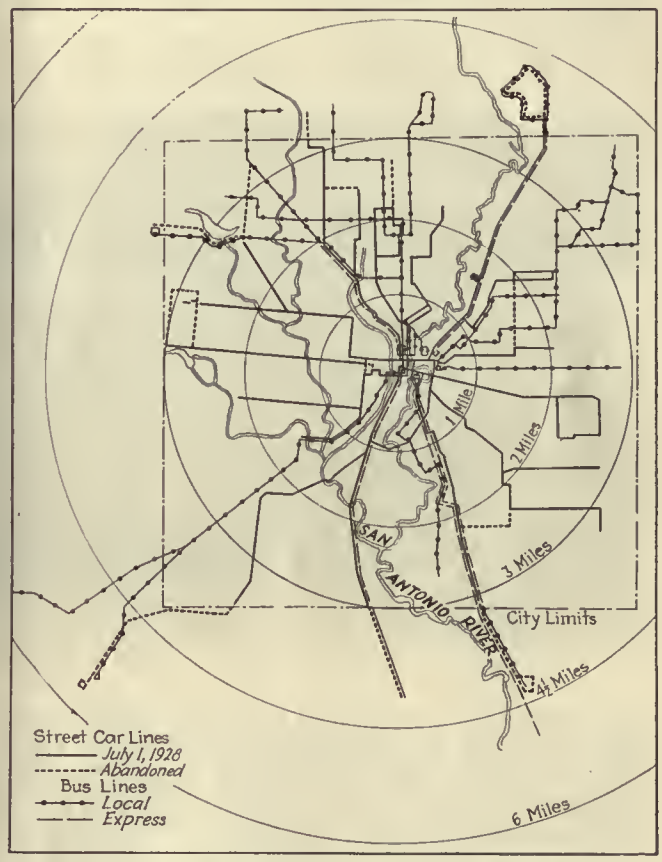
### Need for Emphasizing Modernization

The general requirements of a good ride, just explained, are fundamental, just as the basis of sterling is with silver. But like that, they are not new or sensational, and some other means may be necessary to induce habitual automobile users to give public transportation a trial. This is the reason of many of the things which street railways are doing under the slogan of modernization. It does not matter a great deal whether it is bright paint, upholstered seats, white caps on the crews, or many of the things which are being tried, so long as some of them are done. All show the public that public transportation is abreast of the times and they give a reason to those who have not been using the service to try it. But unless the service is excellent in the fundamental principles enumerated, the trial will confirm the automobile rider more strongly in his habit of using his own transportation.

With this in view, a plan of service has been adopted in San Antonio by which the public is receiving what it wants in public transportation as nearly as it is possible to give it.

The next step was the establishment of a rate of fare which would be satisfactory to the public, and at the same time adequate to cover the cost of furnishing this transportation.

To meet the conditions in its territory the San Antonio Public Service Company adopted what may be called a zone service plan. The central zone is the area approximately 3 miles from the business center of the city. Additional zones are approximately 1½ miles each. Local service is furnished in the first zone, and it is planned to furnish express service to each of the succeeding zones. The advantages to the passenger are apparent. The time required for a street car to make the 3-mile local trip in densely settled sections is approximately twenty minutes, yet the same twenty minutes is sufficient for a bus to give express service to the beginning of the second zone and local service through it. Corresponding time savings are available for each succeeding zone. Another advantage to the passengers is that they




**Electric railways serve the population within the 3-mile limit at a flat fare. Buses at a higher fare operate beyond these limits**

are segregated into groups of neighbors with a considerable degree of personal and community interest. The value of this, while intangible, is very real.

From the economic standpoint, the value of the time saved in furnishing the service is also self-evident. In segregating the passengers into distinct groups, the complications of collecting different rates of fare for different distances is greatly reduced. Again, passengers are willing to pay an additional fare for the increased convenience of the more nearly personal express service. Finally, a schedule of fares has been worked out which allows a rate charge approximately proportional to the distance traveled. This permits future extensions to be made on an economical basis. A certain number of through local buses care for travel between the outside zones, such as between 2 and 3 or 2 and 4.

The lowest payment for fare, as shown in Table I, is a nickel, good only when used with a 25-cent weekly

pass. This form of pass has an especial flexibility in connection with varying zone charges, as shown in the table. For instance, for the central zone passenger, it may be considered as requiring 7 cents for each peak hour ride, and 5 cents for each additional ride during periods of light traffic. For the other zones a somewhat higher rate.

It will be noted from the table that all fares are on a sliding scale, not only as to the distance but also with respect to the frequency with which the passenger uses the service. It will also be noted that although there are twelve rates of fare, only one of the twelve requires the use of any odd cents. Finally, where passengers are segregated into vehicles where only one scale of rate is in effect, only three rates are applicable in that vehicle. A footnote to the table gives the fares between zones other than the central zone.

From the figures in the lower part of the table, it will be seen that all riders paying cash fares are charged $3\frac{1}{3}$ cents per mile. It will also be noted that both the ticket and cash rate in the central zone are somewhat higher when reduced to a mileage basis than in the other zones where transfers are not used, but that they are no higher, and sometimes less, when the passenger uses a transfer.

TABLE II—REQUIRED LOAD FACTOR IN DIFFERENT ZONES IN SAN ANTONIO

| | Seat Trips per Hour Furnished | Pass. Required per Hour | Per Cent Required Load Factor |
|---|---|---|---|
| **Central Zone** | | | |
| 48-passenger street car | 144 | 65.5 | 45.5 |
| 32-passenger street car | 96 | 46.2 | 48.2 |
| 33-passenger bus | 132 | 50.0 | 38.0 |
| 21-passenger bus | 84 | 36.0 | 43.0 |
| **Second Zone** | | | |
| 33-passenger bus | 99 | 35 | 35.5 |
| 21-passenger bus | 63 | 25 | 39.7 |
| **Third Zone** | | | |
| 33-passenger bus | 79.2 | 25.7 | 32.6 |
| 21-passenger bus | 50.4 | 18.4 | 36.6 |
| **Fourth Zone** | | | |
| 33-passenger bus | 66 | 18.2 | 27.6 |
| 21-passenger bus | 42 | 13 | 30.9 |

One bus line express for 2 miles in central zone and local for the rest in that zone and in the second zone.
Three bus lines express in central zone and local in second zone.
One bus line local in three zones.
One bus line local in four zones.
One bus line express in the central and second zones and local in third and fourth zones.




**Latest type of bus used in San Antonio**

### Determination of Necessary Load Factor

With the figures given in Table I and the cost per hour of the various services, the company has determined the load factor necessary to keep the service financially self-sustaining. For this purpose, the cost per hour, including all investment charges, may be assumed as follows:

| | |
|---|---|
| 48 passenger street car with two men | $4.25 per hour |
| 32 passenger street car with one man | 3.00 per hour |
| 33 passenger bus | 3.25 per hour |
| 21 passenger bus | 2.33 per hour |

From these figures the required load factors as given in Table II have been determined.

This table shows that the required load factor becomes less for the outer zone, where the need for seating passengers becomes greater. For this reason it is economically possible more nearly to approach the standard of a seat per passenger for the longer rides to the outer zones.

### Division of Business Between Car and Bus

There are now in operation in San Antonio:

Eighteen street car lines in the central zone.
Six bus lines in the central zone.
Two bus lines local in both central and second zone.

From this it is seen that there are eighteen street car lines and ten bus lines serving the central zone. Of the total number of revenue passengers on the system, 82 per cent are carried on street cars in the central zone and 12 per cent of the total number are carried by buses in this zone. The nine bus lines going into the outer zone carry in the outer zone only 6 per cent of the total revenue passengers. From this, the averages shown in Table III may be obtained.

TABLE III—PASSENGERS CARRIED PER LINE

| Lines | Percentage of Passengers Carried per Line |
|---|---|
| Eighteen street car lines in central zone | 4.56 |
| Ten bus lines in central zone | 1.20 |
| Nine bus lines in outer zones (four also local in central zone) | 0.67 |

It is apparent from Table III that the street cars are being used on the lines where the volume of traffic is greatest. This is carrying into effect the established principle that street cars furnish the best and most economical transportation where great numbers of passengers are to be carried.

### Some Track Abandoned

To rearrange the transportation lines in accordance with the zone service plan and to straighten out some of the indirect routing, it was necessary for the company to

abandon more than 15 miles of track on fourteen different lines. The completeness with which this policy has been carried out is shown by the fact that only five of the eighteen car lines now cross the 3-mile circle, and these lines average less than ½ mile outside this circle. This distance is so small that second zone fares are not collected on any of them. It is further expected that the overlapping will be eliminated on three of these lines.

It is naturally impossible to have all routes so direct that only 3 miles of route from the downtown district is necessary to reach the circumference of the 3-mile circle. But it is worthy of note that only one car line is longer than 4 miles, and this line is a combination of two light traffic lines.

The schedule speeds which have been obtained with this plan of operation have been relatively high. In connection with this fact it must be remembered that schedule speed is affected by three factors, the speed between stops, the number of stops and the average length of the stops. On a short line where the cars are filled, there are naturally more stops per mile and the stops are of longer duration, so that short lines cannot make as high schedule speed as longer ones.

Table IV shows the schedule speed of the various kinds of line, in elapsed time, which includes running time, stopping time and layover time.

TABLE IV—SCHEDULE SPEEDS IN MILES PER HOUR

| | Minimum | Maximum | Average |
|---|---|---|---|
| Single-track lines | 8.49 | 9.32 | 9.00 |
| Double-track lines | 9.44 | 11.55 | 10.00 |
| Bus lines | 9.57 | 14.62 | 12.38 |

TABLE V—PERCENTAGE OF VARIOUS FARES PAID BY REVENUE PASSENGERS

| | |
|---|---|
| 10-cent cash fare | 33.0 |
| Three for 25 cent token fare | 23.8 |
| Nickel fares on passes | 39.4 |
| School rates | 3.8 |
| Total revenue passengers | 100.0 |

### Percentages of Kinds of Fare Paid

The revenue passengers represent 80 per cent of the total passengers. The average rate of fare in the central zone for revenue passengers is slightly in excess of 8 cents, and for all pasesngers it is approximately 6.5 cents. Nickel passes are sold at an average rate of 12,250 each week, and they are being used for an average number of rides of fifteen per pass per week. For purpose of comparison with the other form of weekly pass, this is the equivalent of eighteen rides per week when transfers are taken into account. At fifteen rides per week the average income from nickel pass riders is $1 per week per pass.

### Traffic Checked Constantly

Continuous checks are made of traffic to guide the schedule maker. Conductors' trip sheets give the maximum inbound and outbound riders. These figures are supplemented by street checks taken along the entire route. Three weekdays are selected in each month on which to make a street check for each line. The results are then charted so that characteristic curves for each month are obtained. The curves for the three months in each of the four seasons are then put on a single chart to show the general characteristics for that season.



**Present condition of track laid in 1914**

It has been found in San Antonio that this season division is very satisfactory, due in part to the fact that the schools are not in session during the greater part of the three summer months. From these charts the traffic demands for succeeding seasons are estimated.

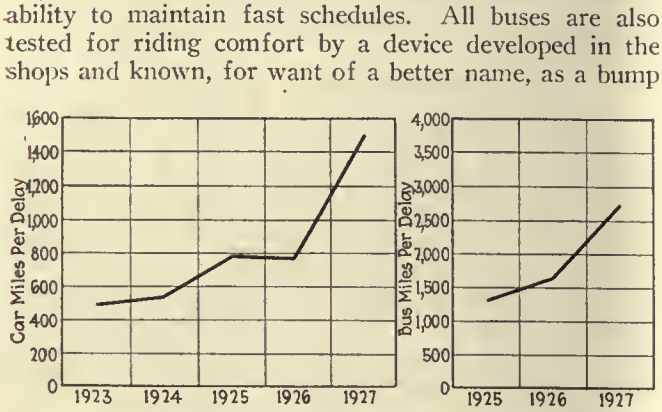
Changes necessary in the basic schedules are made through "special service" cars or buses.

### Cars and Car Equipment

The maximum number of cars required in basic service in San Antonio during 1927 was 120 cars. To have these cars available, 135 were kept in good operating condition. Of this number, 35, or 26 per cent, were purchased within the last five years. A number of the older cars are retained for circus days and other special events. They are kept well painted but are not of the same standard as the cars used in regular service.

The last ten cars received in 1925 were equipped with an air-operated register ringing device, electric signal between the conductor and the motorman, brass side sash, and center lighting fixture. Since they were put in service, brass side sash have been installed in eight additional cars, and brass vestibule sashes in one car for trial. Semi-flush center lights with oval shades have been installed in 74 cars, air-operated register equipment in 70, electric signals from conductor to motorman in 40, Feralun safety treads in 74 and Faraday burners on 70.

The company has now 62 buses in use, of which 30 were purchased between 1923 and 1928 and sixteen in the latter year. Before a new bus is accepted it is run over a test course on paved streets, making complete stops at alternate street intersections, to determine its ability to maintain fast schedules. All buses are also tested for riding comfort by a device developed in the shops and known, for want of a better name, as a bump




**These graphs show the increase in miles run from better maintenance**

meter. It is a spring-arm carrying small equalizing weights and a pen for making a graphical record on a strip of paper which is wound about a slowly revolving drum. It may be placed either on the floor or upon one of the seats.

Tests with this meter have shown very plainly that balloon tires afford so much easier riding that they are now specified on all new buses and have been installed on a number of the older buses. The former high pressure tires were 32x6 and cost in operation about 1 cent per bus-mile. The balloon tires are 34x7½ in. and their cost is approximately 50 per cent more.

The first buses purchased were equipped with rattan seats, but the later buses were furnished with leather-cushioned, double spring-edge double seats. Tests with the bump meter on both types of seats did not show as much difference in riding quality as was expected. However, the appearance of comfort and luxury gave so much satisfaction to passengers that all rattan seats in the 23 buses so equipped have been replaced with leather cushion type seats at a cost of more than $7,000. Not only are leather upholstered seats specified in purchases of all new buses, but they must have either two complete layers of springs, or an air cushion supplementing the springs.

### Overhauling Practice in San Antonio

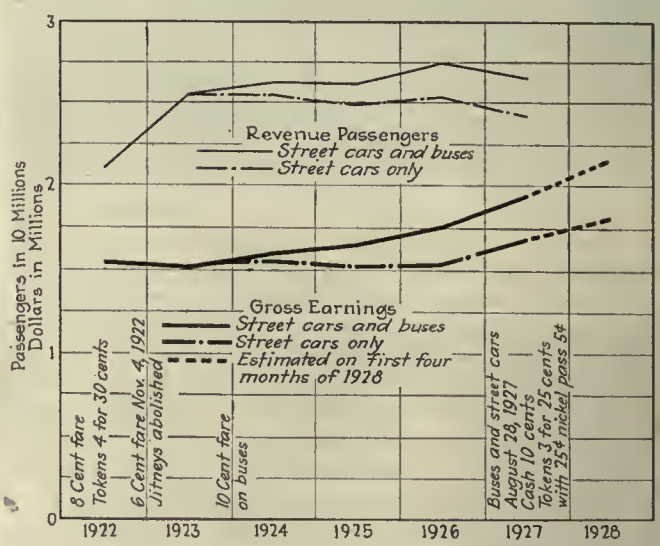
Several years ago cars were repainted at intervals of from four to five years, a period based on the ultimate life of paint. There was considerable fading, but as long as the paint was in good physical condition that was considered satisfactory. For many years the standard color scheme was orange below and lemon above the belt rail, with roof trim and lettering in Indian red. To improve the appearance of the cars it was decided to reduce the period of repainting to two years, and when this standard was attained, the period was reduced to one year, the present standard. All buses have been on this standard from the beginning.

The present standard of coloring for cars, after some experimentation, is lemon below and green above the belt rail with the company emblem on each side of all equipment. For the interior, natural wood finish and two shades of some harmonizing light colors are used to suggest roominess, cheerfulness and restfulness. Circuit breakers, meters, switches, piping, etc., are painted in the same shade as the rest of the interior to make them less conspicuous.

The one year interval for painting is also the standard of overhaul for both cars and buses.

The overhaul on buses is as follows: The engine including clutch and transmission, is removed and left in the garage for overhaul. The body is left on the chassis and moved into the carpenter-paint shop bay where the body receives a complete overhauling and painting. While this is being done, the frame of the engine is either changed for a new one of standard bore or ground to over-size and new sleeves are installed depending on the type of engine, and new pistons and rings are fitted. The crankshaft is either ground or replaced, according to conditions. The carburetor, generator, starter, clutch and other parts are thoroughly cleaned and inspected, the valves and seats are reconditioned and any necessary repairs or adjustments are made. After these operations are completed, the engine is reinstalled and the bus is returned to service.

The overhauling of the street cars follows the same general system used for buses. One of the outstanding operations done on the street cars is the building up by welding and reboring to standard size, or boring to over-size, of the axle and armature bearing housings of the motors, thus correcting the gear centers. All mechanical parts are thoroughly gone over, cleaned, inspected, adjusted, tested and repaired, and the electrical equipment is tested. The armatures and fields are dipped and baked and again tested. On the strength of the reports of the noise reduction committee of the A.E.R.E.A. helical gearing is being installed on the smaller types of motor.




**This chart shows the development in earnings and passengers carried**

While this shorter period for overhaul has temporarily increased the cost of maintenance, the management feels that when the first overhaul cycle is completed the costs will fall considerably below even those of 1923. Already there has been a noticeable decrease in run-ins.

Approximately half the street cars have been through the shop on the first cycle of overhauling. The miles per chargeable run-in averaged 25,508, in 1927, compared with 13,214 in 1926, and for buses 2,800 miles in 1927, compared with 2,200 in 1926.

With the higher bus and car maintenance mentioned, corresponding higher standards have been established in track maintenance. Perhaps the most important develop-

ment has been in the extension of the use of welded joints. Welded joints have always been used in track in concrete on paved streets, this form of construction constituting 77 per cent of all of the track. In 1924 an experiment was made of welding joints in gravel ballasted tracks. The experimental section was 1.43 miles in length, and it proved so satisfactory that additional gravel ballasted track has been improved by welding the joints. The method is now being extended to all track, so that at the present time 87 per cent of all the track has welded joints. This is not only effecting a great improvement in riding quality of the cars and in noise reduction, but it is also materially reducing the cost of track maintenance.

### Financial Results

A very satisfactory measure of success in any kind of transportation is the result on the company's finances and the growth of its business. Both are shown approximately in an accompanying chart. The year 1923 was the first of operation after the elimination of jitneys and with a 6-cent fare. The gross earnings in that year were $1,528,946. These earnings increased in 1926, when they were $1,761,422. It is felt that this increase is largely due to the supply of local service to the public. The willingness with which the public granted the company a higher rate of fare in 1927 is considered a further tribute to the satisfaction which the service is giving. This increase became effective only during the latter part of 1927, but it enabled the gross earnings to be further increased to $1,953,696 in that year. Based on the first four months operation in 1928, it is estimated that the gross earnings will be in excess of $2,200,000 in 1928, corresponding to an increase of 44 per cent for four years. The accompanying curve shows graphically the history of the gross earnings during the past six years.

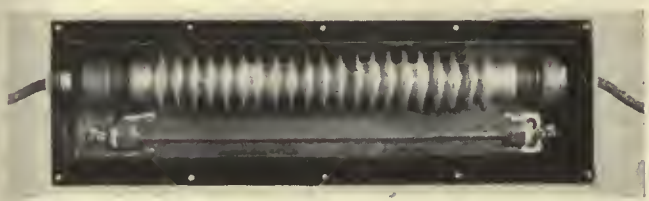
### Telephone Dispatching

A feature of railway and bus operation in San Antonio is the method of dispatching by telephone, but an account of this will have to be reserved for a later issue.

# Resistor Heaters Used in Cleveland Articulated Cars

**Each duplex unit has 45 motor resistor heaters arranged to give the same resistance values on the different controller notches as regular resistors**

RESISTANCE losses are converted into useful energy for heating the new duplex cars of the Cleveland Railway, through use of motor resistor heater equipment. The heating apparatus includes eighteen Consolidated Car Heating Company double unit panel heaters in the rear section of the car and 27 heaters in the front section. Of these 27 heaters 24 are duplex heaters, each having one motor resistor heater unit and one regular



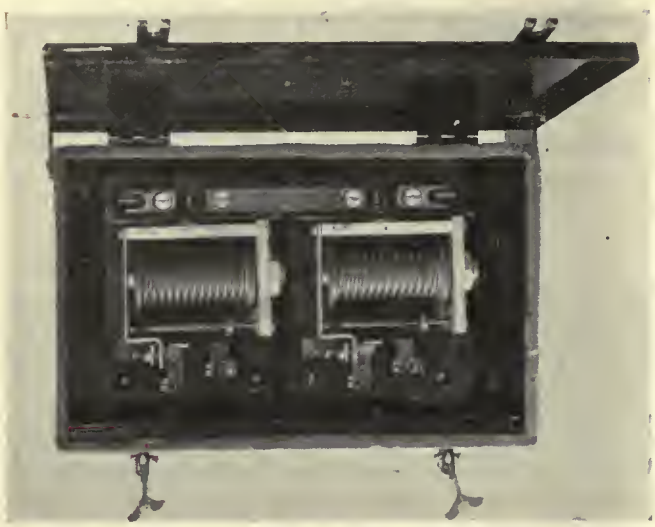
**The duplex heater has one motor resistor unit and one regular inclosed-type heater unit**

inclosed type heater unit, and three having motor resistor heater units only. The motor resistor heater units are divided between the various resistance steps so that all units are subjected to approximately the same energy input. They are arranged to give the same resistance values on the different controller notches as the regular motor resistors under the car.

All heaters are of the panel type and are installed in a continuous duct along both sides of the car. In addition there is also a 1,200-watt, 600-volt vestibule heater for the motorman. The motor resistor heater unit is of extremely rugged construction. It was designed to



**Panel type heaters are installed in a continuous duct along the sides of the car**



Two peak load relays are mounted side by side in a steel box with hinged cover

obtain the necessary mechanical and electrical strength and thermal capacity to insure the unit standing up under severe service conditions. The resistance element of the unit is a nichrome wire coiled in a helix. This resistance element, with terminals swaged on both ends, is placed in a steel tube, the terminals extending out through suitable insulating bushings placed in each end of the steel tube. After the resistance element is placed in the tube with ample clearance between the element and the wall, the tube is filled with a specially treated insulating powder and is then put through a swaging operation which reduces the diameter of the tube and compacts the insulating powder inside the tube. The result is that the resistance element, although self-supporting under normal conditions is held firmly in the center of the tube and cannot come in contact with the steel wall under any condition.

Lead wires of approximately 18 in. length are swaged into the terminals and to protect these connections a short length of steel tube of larger diameter than the main tube extends approximately 2½ in. beyond the end of the latter and is welded on each end of the tube. This forms a junction space which later is filled with a high temperature compound. In order to obtain thermal capacity and radiating surface an aluminum casting surrounds the steel tube. A four-pole double-throw change-over switch is used for connecting the motor resistor heaters in the motor control circuit or for using the regular resistors under the car.



A four-pole, double throw switch is used for changing over the circuit from the motor resistor heaters to the standard car resistors

Another feature of the heater equipment is the use of a peak load relay which cuts out the regular heaters while the car is using maximum power—that is, during the acceleration period. This relay is in circuit with the heaters in both sections of the car so that during the time the motors are taking the heavy accelerating current no current is taken by the regular heaters. The operating coil of the relay is of heavy bare copper wire and is connected in series in the motor circuit. The relay is provided with means for adjustment so that it can be set to operate at the desired current value. The contacts of the relays are in parallel with the thermostat of the regular heater equipment and therefore carry only a very small current.

The regular heating elements in both the front and rear sections of the car are under thermostatic control, each section having its own thermostat equipment. It is estimated that the accelerating resistance losses, which will be converted into heat in the car when the motor resistor heater units are being used for acceleration, will average approximately 6.6 kw. during the time the car is in service.

## Noise Reduction Efforts in London

EFFORTS of the London Underground Electric Railways to reduce noise on its underground lines were pointed out recently by one of the company officials. The statement was inspired by a somewhat sweeping indictment on noise in the tube railways, contained in an article by Prof. Henry J. Spooner in *The Nineteenth Century and After* for September.

The statement in defense of the railways points out that the noise in underground lines is caused primarily by the contact of steel upon steel but is intensified by the limited space to which the noise is confined. The paramount need for minimizing any risk of fire necessitates the employment of metal in some instances where wood or other sound absorbing material would be utilized on an ordinary railway.

A number of steps, however, have been taken and have already been mentioned in ELECTRIC RAILWAY JOURNAL for Oct. 1, 1927, page 567.

The statement goes on to point out that noise can be kept out of the cars to a large extent if the windows are kept closed, but this makes the cars uncomfortable to ride in. Noises arising from the wheels and other parts of the truck can be kept from entering the car by a skirt surrounding the truck and wheels, but this cannot be very low, because it would then hinder free access to the brake gear, and other mechanism. Various forms of gears are now being tested to reduce noise but as improvement in this direction is made there is a call for higher speeds, and higher speeds cause increased noise.

Efforts to reduce the noise by changes in the track have been confined largely to keeping the rails smooth and using resilient material under the rails. Rail grinding, particularly of rails on curves, has helped, but the rubber and composition pads inserted between the rails and the ties do not seem to have had any effect in reducing noise. The ties are of jarrah, an exceedingly hard fire-resisting wood. Part of the Piccadilly tube has been provided with ballast between the ties. This seems to have had an alleviating effect on noise reduction.

# Future Rolling Stock

## From Viewpoints of Operator and Manufacturer

**Growing demand by the American public for greater comfort and increased speed in transportation is leading to improved car designs. Low first cost and maintenance are nevertheless important factors in dictating types of future rolling stock**

AN ANALYSIS of the factors which affect the development of future rolling stock was made in an article in last week's issue of ELECTRIC RAILWAY JOURNAL by Charles Gordon, editor. The following three articles present a further discussion of this subject, one by an operating executive who has had a leading part in the present movement toward the improvement of electric railway rolling stock, and two by representatives of leading car building companies. This material was prepared originally for presentation before the equipment division of the American Electric Railway Engineering Association at the Cleveland convention. Because of the great interest throughout the industry in the car situation this discussion of Mr. Gordon's article is printed here as a symposium.

### Car Purchases Should Not Wait for Final Verdict on New Equipment

BY L. J. DE LAMARTER
*Vice-President and General Manager*
*Grand Rapids Railroad*

AS I ANALYZE Mr. Gordon's article, it is in the nature of a plea for co-operation and co-ordination of efforts to produce a proper design for future rolling stock. I agree that it should be within the province of the manufacturers to initiate the design and to build the cars, but in doing this they must consider the problems of the transportation industry and not merely the manufacturers' problems. In addition to the need of improved appearance, easy riding, quietness, fast acceleration and light weight for future equipment, other general requirements from the transportation department's viewpoint are covered by the report of the committee on service betterment which should be considered carefully in connection with this subject.

One point which I believe needs to be supplemented is the statement that "during the past eighteen months there has been a sudden further drop in new car orders which is now generally attributed to the fact that many properties are holding off needed purchases, while awaiting the outcome of recent experiments in design and construction."

As I see it, there are other governing factors which are also responsible for the reduction in cars sold during the past eighteen months. Some of these are as follows: (a) The volume of business during that period did not warrant the increase in investment which would be occasioned by the purchase of new cars; (b) Uncertainty during the past eighteen months as to when the gradual and continuing decrease in passengers carried throughout the country will stop, and (c) Uncertainty as to when the much-discussed privately-owned automobile saturation point will have been reached.

I feel that it is the combination of these factors with the one mentioned by Mr. Gordon that has caused the transportation executives to postpone the purchase of new equipment until the public riding habit becomes more stabilized. It is my belief, however, that if the car builders had undertaken the development cost and had been prepared to offer to the transportation industry fully developed, standardized cars which would meet present-day requirements, together with a satisfactory financial purchase plan, the sale of cars during this eighteen months period might have been greater.

A favorable sign that we are getting somewhere was indicated to me in an editorial I read recently in a Cleveland newspaper, which, in covering the convention, mentioned the fine exhibit of cars and buses, saying the street car designers were making their cars look like buses and the bus designers were building some of their buses to look like street cars. There is at least evidence here of an open mind on the part of some of the car builders, which promises ultimate success of the effort to develop cars that will actually attract passengers.

Regarding future rolling stock, I do not believe that we need to hold up car purchases now for further drastic change in design over the cars in the Cleveland exhibit. Refinements, pleasing color combinations and attractive lines will continue to be the aim of the car builders, which is in keeping with the order of the day, and improved trucks and other essentials to a modern car may be expected to come along gradually as experience increases with some of the new designs that are being tried.

### Low First Cost and Maintenance Must Be Combined With Attractiveness

BY JAMES A. BROOKS
*Chief Engineer The J. G. Brill Company*

VERY strenuous efforts are being made to solve the rolling stock problem and produce more modern and attractive cars, but of the many innovations that are being tried, only those that measure up to the requirements of actual service, over a reasonable length of time, may be considered practical.

There has grown with the industry many variations

in fundamental forms and dimensions for cars. It was thought a few years ago that the time had arrived when common fundamentals could be adopted to suit most of the conditions and thereby enable the car builder more nearly to approach mass production, with an ultimate saving to the purchaser.

A committee was appointed by the association to study the matter and determine upon these fundamentals, and immediately upon the completion of this work the demand arose for something radical and different. For this reason the co-ordination work failed of its purpose.

Previous to this, at the most critical period in the history of the industry, the Birney car, thousands of which were built and thousands of which are still in satisfactory operation, was manufactured in mass production due to standardization of fundamentals; and this car was the most outstanding car of all time, for it accomplished most of the things to be desired in rolling stock, which were: Economy in first cost and in maintenance, low operating cost due to exceptionally light weight, rapid acceleration, and one-man operation. As soon as this type of equipment had met the immediate crisis with which the industry had been faced, the desire for larger equipment became prevalent, and for the past several years modern double-truck light-weight cars have been used—almost to the exclusion of the four-wheel car.

The newly-developed types of motor buses, which appealed both in appearance and comfort, unquestionably placed the electric rail car at a disadvantage in the minds of the traveling public, particularly on lines operating cars that were very old, or on which maintenance had been deferred; and comparisons were made between the improved type of motor bus and antiquated car equipment. This brought about a trend in design of the electric rail car toward the motor bus and with it the introduction of comfortable seats and other improvements, and these alone, in many cases, have been responsible for improved service and increased riding. It is a fact that what the electric railways need most are new cars which will be inexpensive both to purchase and maintain.

The design and arrangement of the bodies of recent cars have been materially improved, and various types of propulsion are being experimented with. These, at the present time, can be considered only as experimental and will, most likely, remain in this state for some time to come.

It is unfortunate that in these new methods, which embody a combination of automotive and electric railway practice, the cost in many instances is greatly increased, without showing any particular advantage of the newer type. It may be, however, that from these will develop something that will accomplish many of the improvements for which the industry is seeking. In such an event, however, a simplification will undoubtedly have to be made, for the various equipments being experimented with have added complications and increased cost.

The car of the future must be of adequate size to meet the requirements of mass transportation and yet not be too large or too heavy to operate during the dull periods. In the matter of light-weight equipment care must be exercised that strength is not sacrificed beyond the point where there is a reasonable assurance that excessive maintenance will not offset the savings.

It appears that there may be two classes of rolling stock; one, where the passenger traffic is necessarily heavy and in which the quick movement of passengers is of more importance than luxury, and the other on lines where bus and automobile competition are more prevalent and where luxurious refinements must be provided to invite car riding.

Future rolling stock must be attractive in appearance, probably of the streamline sedan type, with particular attention devoted to exterior and interior decoration. It must be economical to purchase and maintain, including only those advanced ideas in design which offer definite and practical value. Designers are seeking simplification of control and braking, with sufficient power to develop an acceleration of approximately 5 m.p.h.p.s. and with brakes that will accomplish equally as fast retardation.

## Co-operation Between Manufacturers and Operators Essential

By A. L. Kasemeier

*Vice-President in Charge of Sales*
*Cincinnati Car Company*

BEFORE we consider the type of future rolling stock, the reasons for advocacy of the replacement of existing equipment at this time should be determined. Both operators and car builders were on solid ground when the so-called obsolete equipment of yesterday was built and put in operation, for the universal 5-cent fare seemed unchangeable and the durability of rolling stock was of greater importance from the standpoint of operating costs than was that of luxury for the purpose of attracting additional patronage. There are today, however, two distinct reasons why a change in the type of rolling stock is desirable, if not absolutely necessary, if we are to maintain our position in the field of urban and interurban transportation. The first is the growing demand on the part of the American people for a greater display of luxury in transportation vehicles than for even the comforts of home. The second reason is that the electric railway car now has a real and formidable competitor in the cheap automobile.

I do not regard the bus or the expensive automobile as menaces to existing electric railway lines if we look with care to the future development of these properties. First thought should be given to the adoption of a car which will effect an increase in the net earnings of our properties, and, naturally, operating costs and passenger appeal are considerations of major importance. The passenger of today is in a position to change his means of transportation unless we offer a type of service that will attract and satisfy him.

I do not agree with Mr. Gordon that car builders have been trailing, rather than leading, in developing improved rolling stock, although I will admit that if we were consulted more freely and frequently before specifications are prepared by the equipment and operating officials, greater economy would result in original costs, and cars would be built more nearly to a standard which would be accepted and, in fact, welcomed by the bankers to whom we look for assistance in the marketing of securities. Electric railway credit and, consequently, operating costs would be vastly improved if we could get the investment banker to regard electric railway car trust securities as equal in security to those of steam roads; and this is possible of accomplishment if we would so standardize rolling stock that the banker could think of the value and mobility of the security (the car) rather than of the credit of the particular lines to which cars are leased.

There should be no rivalry between the builders of railway equipment and operating officials for leadership

in designing cars, but rather the closest kind of co-operation. The car builder, by reason of his constant contact with market conditions and equipment and with operating officials of railways, is often in position to advise against the adoption of certain sizes of structural material, plates and even screws and bolts, because many of the old sizes of these things are not now standard with mills and jobbers and are, consequently, both difficult and expensive to obtain; and while he may be unwilling to criticize other features of railway specifications, he is in excellent position to do so for he hears complaints and often is blamed for appearance and unsatisfactory service of parts of the finished car for which he is in no wise responsible.

This question of closer co-operation between the operator and car builder is one of great importance to the industry, and the observations made and pointed out by Mr. Gordon of the growing tendency on the part of railway officials to vie with each other in an effort to become not only car designers but builders also should be considered with alarm. I do not question the ability of the equipment and operating officials to design and build electric cars, but two things will result if the practice continues. The first is that maintenance of the property now intrusted to their care will surely be neglected, and the second is that talent and capital now devoted to car manufacturing purposes will seek other fields of activity, and in either case the interests of the industry will suffer.

As modestly intimated in his address, Mr. Gordon has been most active in urging manufacturers to get busy in the development of cars to meet today's demands, but at the same time he very wisely has stated that: "Right now the manufacturers need active suggestions and co-operation." We have, naturally, always depended upon equipment men and operating officials for advice, and to them in a large measure is due credit for what has been accomplished in the present development. Much thought is being given by us to further improvements, and we will welcome any suggestions.

Mr. Gordon calls attention to the desirability of developing a distinctive car which could be sold as other manufactured products are sold. Our company has what might be termed a ready-made car, designed more than eight years ago, but flexible as to size, which we consider suitable for a wide range of operating conditions. This car embraces what we term the four features of balanced design, namely: Speed with safety, capacity with comfort, light weight with strength and beauty with low cost. The same construction and general design is used for both city and interurban service. The unit is built for speeds up to 60 m.p.h. and can be operated safely at the higher speeds by the installation of Duplex air-magnetic braking equipment. By the use of alloy steels and aluminum, and by careful balancing of all the elements of the structure, the weight has been reduced to a safe minimum.

I do not wish to be understood as saying there will be no further developments in car design, but I feel safe in asserting that future rolling stock will not depart radically in design from that which was exhibited at the Cleveland convention, and that further developments will be gradual and along lines to be determined by both operator and car builder. In the meantime, however, if a railway's equipment needs replacing because of excessive weight, low speed or lack of attractiveness, it should not wait for the seer to tell what the characteristics will be of cars five years hence.

# Company and Department Awards in New Contest

ELECTRIC RAILWAY JOURNAL'S New Maintenance Contest includes several important features:

An attractive trophy will be awarded to the company making the greatest contribution to the improvement of maintenance practices through participation in the contest.

Special certificates of merit will be presented to each department making the best individual showing.

An individual cash prize of $200 will go to the person submitting the best maintenance idea during the contest.

A series of twelve individual prizes of $25 each will be divided equally between the following four maintenance divisions: (1) Rolling stock and shops; (2) way and structures; (3) electrical and line; (4) buses and garage, including shop equipment for bus maintenance.

A cash payment of $5 will be made for each item published.

Start at once and help your department and company to win the recognition they deserve for improved maintenance work. In addition you can win one or more of the valuable individual prizes.

See ELECTRIC RAILWAY JOURNAL for Oct. 20, pages 724-725, for complete details. An attractive folder giving full instructions and suggestions for preparing entries in the contest is available and will be mailed to those interested upon request.

# Pennsylvania Railroad To E

## from New Y

**$100,000,000 project will cover 1,300 miles of track and will require 365 new electric locomotives. Said to be largest electrification in world**

## Principal Facts

*about Pennsylvania Railroad Electrification from New York to Wilmington, Del., and from Philadelphia to Columbia and Atglen, Pa.*

| | |
|---|---|
| Miles of railroad to be electrified | 325 |
| Miles of track to be electrified | 1,300 |
| Electric locomotives required for new operation: | |
| Passenger | 165 |
| Freight | 200 |
| Total new electric locomotives required | 365 |
| Electric locomotives now in operation | 84 |
| Number of passenger trains: | |
| To be operated by electric locomotives | 318 |
| To be operated as multiple-unit trains | 218 |
| Estimated cost to complete program | $100,000,000 |
| Estimated time to complete program | 6 to 7 years |
| Saving in number of freight trains operated | Approximately 50 per cent |
| Size of freight trains to be operated | 125 cars |
| Speed of freight trains under electrified operation | 25 m.p.h. |
| Miles of railroad already electrified (includes 140 miles Long Island Railroad) | 333 |
| Miles of track already electrified (includes 418 miles Long Island Railroad) | 960 |
| Total P.R.R. line mileage which will be operated electrically on completion of new program | 658 |
| Total P.R.R. track mileage to be operated on completion of new program | 2,260 |

ELECTRIFICATION of the entire Pennsylvania Railroad between New York and Wilmington, Del., including both passenger and freight service, has been authorized by the board of directors of the Pennsylvania Railroad, according to an announcement by General W. W. Atterbury, president.

This project will require an estimated expenditure of $100,000,000 to be spread over a period of the next seven or eight years, at the rate of about $15,000,000 per year. Approximately 60 per cent of the total amount will be spent for catenary, transmission lines and substation construction and 40 per cent for rolling stock. This will be a normal percentage of Pennsylvania Railroad's improvement expenditures which have been averaging $70,000,000 a year. The proposed capital expenditures for electrification will make unnecessary certain other capital expenditures on this section of the railroad which would have to be made if electrification plans were not carried out.

The new project covers 325 miles of line and 1,300 miles of track. This authorization is part of a plan which includes also the electrification of the grades between the Susquehanna, Schuylkill and Delaware River valleys and Eastern terminals. According to present plans the first section to be electrified will be between North Philadelphia and Trenton, the next step between Newark and New Brunswick and the final section between New Brunswick and Trenton. At present the system is electrified between Long Island City and Newark and from Philadelphia to Wilmington. The latter section has just been completed.

Overhead construction and not third rail power supply will be used on this installation. Alternating current at 11,000 volts, single phase, similar to that now in use in the Philadelphia suburban service, will be adopted. Decision to use this type of system was made after a study of the systems now used extensively in Germany, Switzerland and Sweden and in this country on the New York, New Haven & Hartford, Norfolk & Western and the Virginian Railways.

In view of the fact that the suburban sections of the railroad will be electrified first, the purchase of cars will probably precede that of the locomotives. In the suburban service multiple-unit cars similar to those now in use on the Paoli division at Philadelphia will be used.

The through freight and passenger service will be handled by electric locomotives of a type recently developed by the electric railway manufacturers. Three types of these locomotives have been developed, one for high-speed passenger service, one for high-speed freight service and one for switching. When used singly or in multiple, as required, these locomotives will provide any power demanded by the weight or speed of a train. They will be so designed as to permit the maximum interchangeability of parts, the minimum cost of maintenance and the simplest and most direct method of manufacture. By the method of operation proposed it is expected eventually to reduce the number of freight trains 50 per cent for a given car movement and to increase the speed to any reasonable extent required. This of itself provides for a 100 per cent increase in capacity in so far as freight movement is concerned. In the case of passenger trains it is expected to eliminate all double-heading and most if not all of the second sections of trains, and to avoid the possibility of rough handling due to limited

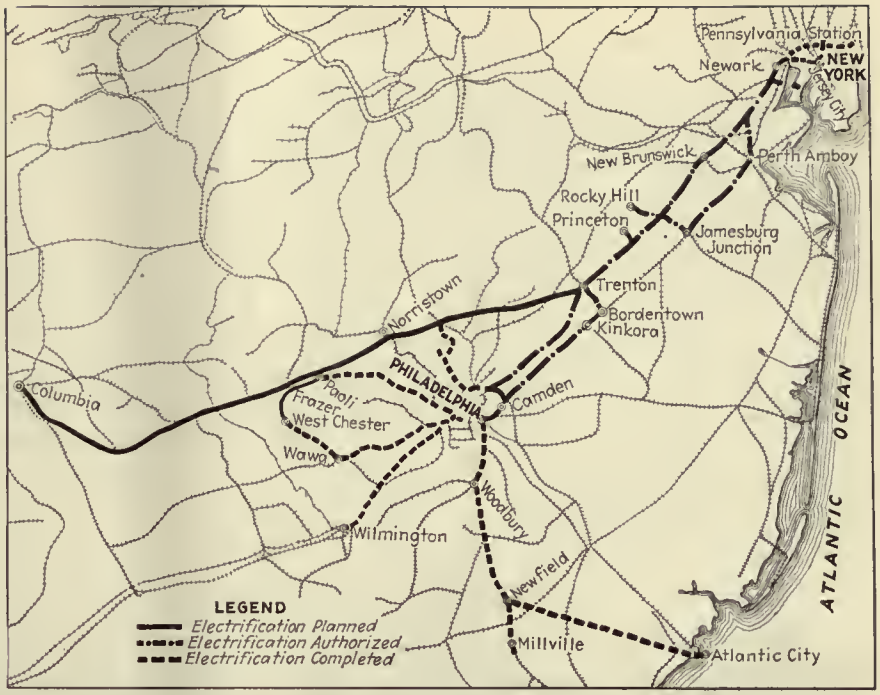
# Electrified

## Wilmington

starting capacity, all of which makes for greater comfort, better service and increased capacity of lines.

### Immediate Factors Which Influenced the Decision

The immediate factors which influenced the decision to proceed with electrification at this time were as follows: greater economy of electric operation as compared with steam operation in dense traffic territories; the growth of the southern passenger business; the increasing density of both freight and passenger business on the Eastern lines of the railroad and the probability that in the future more rapid movement will be required; the desirability of utilizing the advantages of electric operation in connection with the construction of the new passenger terminals at Philadelphia and Newark; the desirability of providing motive power that would meet the growing requirements from the standpoint of weight of trains, speed and reliability. The probability that the project, if started now, would be completed with a less total expenditure, all matters considered, than if started at a later date, was another factor in the present move.




**Map of proposed, authorized and completed electrification of Pennsylvania Railroad. This does not include the Long Island Railroad**

Of the 365 electric locomotives required eventually for this electrification, from 250 to 300 will be purchased within the next five years. Arrangements have been made for the Pennsylvania Railroad to purchase power from the Public Service Corporation of New Jersey and the Philadelphia Electric Company.



**Catenary bridge spanning five tracks on the Wilmington section**



**View along the Wilmington line, electrification of which was completed recently**

This electrification is claimed by the railroad officials to be far greater in magnitude and importance than that of any other railroad in the world in miles of track to be electrified, in volume and density of passenger and freight business handled, in size and amount of equipment required, in the number of trains affected, and in terminal operations involved.

The authorization resulted from exhaustive studies of the whole industrial transportation situation in the Eastern part of the country, including the terminals already under way and projected for Philadelphia and Newark. While this analysis was worked out in detail on the basis of the traffic estimated for the year 1935 the probability was not lost sight of that by 1950 the metropolitan area around New York would extend to New Brunswick on the west and well out on Long Island on the east, containing 30,000,000 people; and that there would be similar developments in other cities.

The next electrification development will be that already planned on the Philadelphia division, Trenton branch, to Pomeroy, and thence to Columbia, as shown on the map on page 807. This will probably be followed by electrical equipment of lines in and around Pittsburgh, eventually to be connected with the Eastern lines.

## When is a Community an Advertisable Product?

"WITHOUT adequate public utility service a community is not a successful advertisable commodity, in the same sense that food without flavor is not a successful advertisable commodity. As a community's public utility service is good or bad, so in like degree is that community a comfortable, convenient and satisfactory (or the contrary) place in which to live and do business." In these words A. H. Herrmann, publicity director of the Virginia Electric & Power Company, Richmond, Va., addressed the Richmond Advertising Club at a weekly meeting held recently. He stressed the newspaper as the most effective medium for public utility advertising.

After giving a résumé of the advertising budget of the electric railway industry, Mr. Herrmann stated that his company was spending more money today for advertising than at any time in its history.

## Hazards in Spray Painting

AN ARTICLE in the *Journal of Industrial Hygiene* for June, 1928, quoted in part in the *Monthly Labor Review* for September, 1928, discusses the hazards of spray painting. The author believes that the spray gun, as an industrial tool, has come to stay, and any attempt to forbid its use will simply arrest the wheels of progress. There are certain hazards in its employment, but they can be lessened or eliminated with comparative ease.

Periodic physical examinations are regarded essential for all workers in spray painting within inclosed places. Where the compound used contains lead or benzol, the person should be examined at least once every six months, and these examinations should include the various blood cell counts. Persons using siliceous materials in spray painting should be examined and should have X-rays of their chests made at least every two years.

The principal faults found in commercial spray installations were in the location of the spray booth, method of use of the equipment, lack of cleanliness, poor design and inadequate air supply. Indoor spraying should be done in a properly constructed booth with exhaust ventilation. The face area of the booth should be from four to eight times the area of the object being sprayed, and wide booths should have multiple fan installations or a large exhaust fan. The booth should be cleaned periodically, and walls and ceilings should be greased or papered, or both. Fans should be located in the rear or sides of

the booth and preferably low, as most of the harmful substances in the paint give off heavy vapors or heavy solids. The air to supply the fan should be fresh, and preferably from the outside.

# Transportation Prominent at West Virginia Meeting

**In a stirring address, J. P. Barnes, president of the American Electric Railway Association, bespoke a new trend of thought for the industry. A. C. Spurr new president**

SEVERAL subjects of interest to electric railway representatives were included in the program of the eleventh annual convention of the Public Utilities Association of West Virginia, held at Huntington, W. Va., Oct. 24-25, 1928. Among these were "The Utility's Responsibility to the Public," "The Trend of Transportation," "Public Utility Safety," "Improving Foremanship" and "Structural Rate Making."

The keynote for electric railway men was struck by J. P. Barnes, president of the A.E.R.A., who urged that all agencies of local transportation be considered a part of one system, serving one public, but giving the various classes of service demanded by the public of today. He made an appeal for more fundamental thinking and a broadened conception of the important problems of community transportation and traffic congestion, to conform to changed conditions in modern cities.

"The world has stepped on the gas and is going somewhere. Are we going too?" With these words, Mr. Barnes issued a bold challenge to the industry. The paper is published, in full, elsewhere in this issue.

"The Utility's Responsibility To the Public," was the subject of an address by G. M. Alexander, president Monongahela-West Penn Public Service Company. Because the public has granted franchises to operate and in many instances is a part owner of the business, Mr. Alexander asserted, it has the right to expect that the utility officials be men of good conduct in private life. Speaking of return he said, "I don't believe the public is so seriously concerned with rates and fares as we think, if we satisfy the demands of service. The rates must be just to the public and to ourselves in order to give the public the service expected."

"Honesty, absolute and scrupulous, not merely legal honesty," was listed by the speaker with other requirements for successful utility operation. Another was the caution against making any promises that cannot be fulfilled within the expected time.

### Man Power Important Weapon

C. I. Weaver, vice-president of the Ohio Edison Company, Springfield, Ohio, speaking on "Man Power," said that this is by far the most important available tool or weapon of the utilities. Courage, intelligence and ambition are among the qualities to be sought in new employees. "If we are to guard our man power we must watch the office boy."

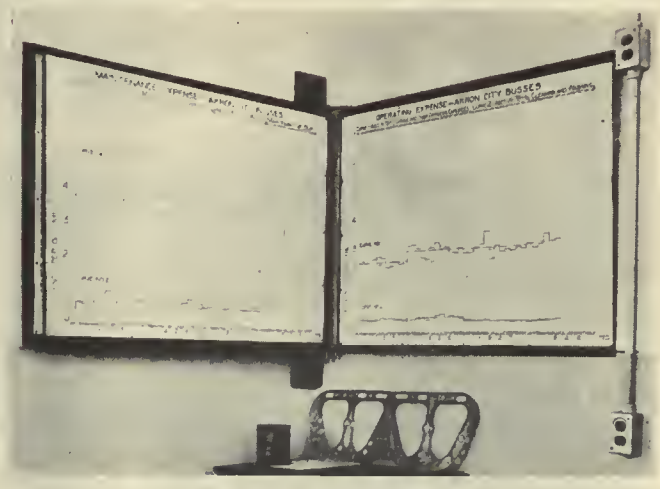
An address on "Public Utility Safety" by Fred A. Lange, Ohio Department of Safety, dealt principally with the light and power industry. He said that the iron and steel industry is inherently more hazardous than the light and power industry yet by personal effort on the part of high officials one concern, the Lorain Steel Company, has completed 3,000,000 man-hours without an accident, as compared with an average of 48 accidents per 1,000,000 man-hours in the light and power industry. To officials he addressed this final remark, "You men who are the managers—it is not sufficient to put someone in charge of safety, you must take a personal interest."

N. M. Argabrite, vice-president American Gas & Electric Company, dealt with fundamentals of "Structural Rate Making." He showed that because readiness-to-serve and per-customer costs may total to ten times or more the actual manufacturing cost, energy may be sold to one customer for 1 cent at a profit and to another for 10 cents but at a loss.

Arthur M. Hill, president of the association, presided at the meetings. He is vice-president of the Charleston Interurban Railway and president of the Blue & Gray Transit Company. Officers for the ensuing year are: president, A. C. Spurr, general manager Wheeling Traction Company; vice-presidents, W. F. Ficklen, manager Appalachian Power Company; C. H. Hardesty, assistant to president Monongahela-West Penn Public Service Company; Fred M. Hawley, treasurer Bluefield Telephone Company; executive secretary, A. Bliss Crum, Charleston; treasurer, G. B. Moir of the Appalachian Power Company, Charleston; and assistant treasurer, J. W. Cummins, assistant treasurer Charleston Interurban Company.

# Hinged Wall Charts An Aid To Meetings

LARGE wall charts that are clearly visible from any point in the conference room are being found invaluable for reference purposes during foremen's meetings of the Northern Ohio Power & Light Company in Akron, Ohio. These charts have been made 30 in. high and 40 in. long, and have been mounted on sheets of veneer hoarding which are hinged to a wall holder by means of rods running through metal loops at top and bottom of the frame.



**The charts on this rack can be removed readily for current additions**

Charts showing pertinent information such as mileage maintenance or operating expenses can be plainly displayed. By removing the thumb tacks the sheets can be removed for replacement or changes.

# PRACTICAL IDEAS

## *for Use by the* Maint

### Reclaiming a Badly Bent Steel Trolley Pole

By E. M. Miley
*Estimating Engineer*
*Chicago Surface Lines, Chicago, Ill.*

RECENTLY a car, while entering one of the tracks of the Cicero and North Avenues car station, was derailed and hit a steel trolley pole, bending it badly about 4 ft. above the ground line. The pole was one of the main messenger poles holding up the trolley special work in the rear of the car station and also carried a floodlight lamp, bracket and switchbox. The pole was bent so badly that one of the tracks could not be used for operation.

The problem confronting the railway was how to renew the pole in its same location and keep it in line with present poles so as not to interfere with car operation or with the overhead work. If the old pole was to be removed and a new one installed, all the overhead wires would have to be removed, which would cause a slacking off of the trolley special work and fixtures. This would entail an expense amounting possibly to $250.



**Various Steps in Method Used to Reclaim Steel Pole**

1. Condition of steel pole before repair work was started.
2. In addition to carrying overhead messenger wires the pole carried a floodlight, lamp and bracket.
3. A temporary wooden pole was lashed to the steel pole as a support.
4. A new piece of tubing 5 ft. long was welded in place.
5. Placing the upper part of the pole in position.
6. View of the pole after reclamation.







# ıance Man

The idea of cutting out the bent section of the pole and welding in a new piece of tubing seemed to be the logical way of performing the job.

The strain on the pole was in three directions, the main messenger running north and south, and a span wire and pull-off wire to the west. To distribute the strain evenly all around the pole, a temporary strain guy was installed to the east. Then, of course, the strain was only a down thrust.

First one of the company's standard crossarm brackets was put around the pole so that the load, when the bent section was cut out, would rest on top of a temporary wooden pole lashed to the steel pole. The bent section was then cut out and a new piece of tubing 5 ft. long was welded in place. The accompanying illustrations show various stages of the work. The sleeves used are the same as the standard sleeve used in pole reclamation by the railway. The total cost of labor and material for the job was $67.87.

## Cleaning and Painting Underside of Railway Bridge*

By Thomas O. Smith
*Superintendent of Overhead Charleston Interurban Railroad, Charleston, W. Va.*

CLEANING and painting the understructure of a bridge on a line of the Charleston Interurban Railroad, Charleston, W. Va., was done successfully by constructing a movable platform and attaching it to two messenger wires running the length of the bridge underneath. The platform was moved from one position to the next by sliding the snatch blocks, to which ropes fastened to the scaffolding were attached, along the messenger wire. When located, the platform was pulled up to working position and safety slings were attached to the bridge beams as found most convenient.

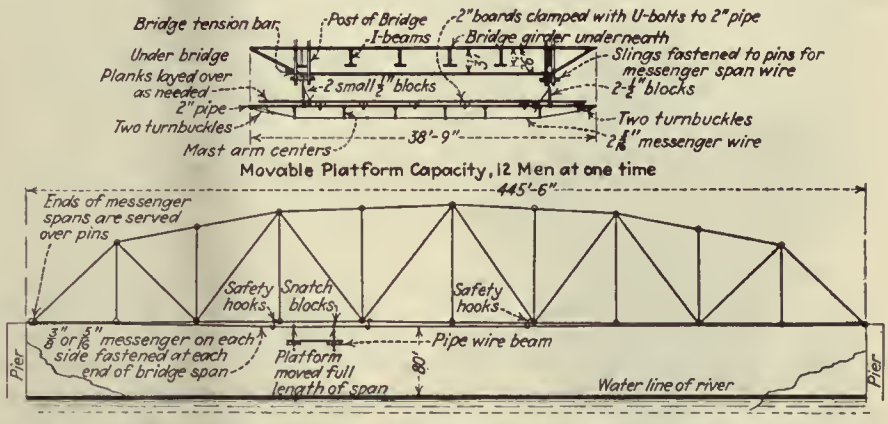
The side members of the platform were constructed of 2-in. wrought-iron pipe with mast arms hanging down. A $\frac{5}{16}$-in. wire attached to either end of the wrought-iron pipe passed through the ends of the mast arms and was tightened by turnbuckles. There were two of these structures, one on either side. The mast arms were spaced 5 ft. apart and 2-in. boards were used for the flooring of the platform and were fastened to the 2-in. pipes by U-bolts. The size of the platform was 38 ft. 9 in. x 42 ft. 9 in. and had a capacity of twelve men.

The messenger wire that supported the platform was run underneath the bridge from end to end and was tied to bridge pins. Other safety slings were tied to the bridge arms as found most convenient and safety hooks were fastened to the messenger wires at either side of the platform. By use of this construction the labor cost for the job was reduced approximately 30 per cent.

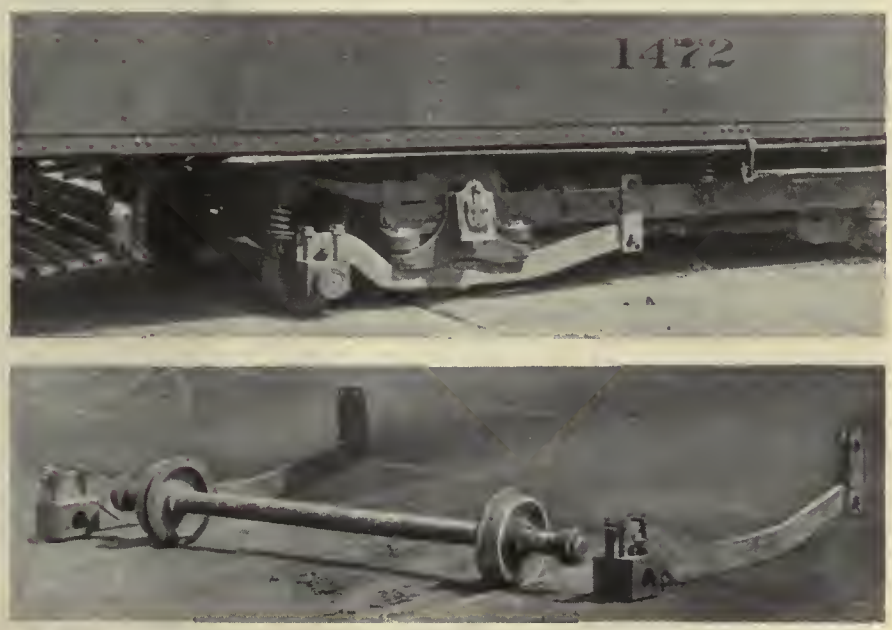
**Submitted in* Electric Railway Journal *Prize Contest.*

## Dolly Truck for Broken Axle

FOR bringing in crippled cars of the single-truck type when an axle is broken, the Virginia Electric & Power Company has developed the so-called "dolly truck," shown in the accompanying illustrations. It consists of nothing more than two side bars and an axle fitted with a pair of small wheels, and can very easily be attached to the end of the truck frame. The two side bars fit underneath the journal box pedestals, being bolted at one end to the side frame of the truck. The other ends rest on a pair of bearings on the outside ends of the dolly axle. The two pictures tell the story.




**Above, crosswise view of the platform and attachment. Below, longitudinal view showing how messenger wire was attached to provide easy movement of the platform**




**Above, the dolly truck under a car. Below, the truck dismantled.**

# Improved Equipment Suggestions

## Hydraulic Feed Surface Grinders

DESIGNED for more rapid grinding and higher capacity are two hydraulic feed surface grinders, equipped with oil gear, products of the Gallmeyer & Livingston Company, Grand Rapids, Mich. The oil gear mechanism makes possible any longitudinal table speed up to 55 ft. per minute. The feeds may be set slow enough to require nine



**No. 5 hydraulic feed surface grinder**

hours to cover the working surface of the table or they may be set to enable the operator to cover the entire working surface of the table in 3½ minutes. The oil gear hydraulic feed reciprocates the table at a variable rate of travel and is connected to a cross-feed engine mounted under the saddle, arranged so that at each reversal of the reciprocating table it actuates the cross-feed mechanism.

For raising and lowering the wheel head a large hand wheel is used. This gives a direct action through a worm gear to the elevating screw. The wheel is graduated in one-quarter thousandths with a movable pointer which can be set for convenient readings. By turning the smaller hand wheel or knurled hand knob in the center of the large wheel, a back-geared action to the elevating mechanism is provided. The disk in the center of the hand wheel has a graduated dial ring which can be set at zero in relation to the pointer mounted on the spoke of the large hand wheel. Both inner and outer wheels turn but the graduations on the inner wheel are arranged to read on this moving pointer, giving a Vernier effect. By this it is easy to get readings of adjustments in ten-thousandths. With this sort of graduation and an accuracy in the machine that makes this available in service it is possible to increase greatly the accuracy of work turned out by surface grinding.

## Operating Conditions Affect Spark Plugs

SOME reasons why one bus or truck can operate a greater mileage without spark plug trouble than another are explained in a service bulletin recently issued by the A. C. Spark Plug Company. It states that some buses operate at low speeds in towns, stopping frequently and with the engine idling for long intervals, while others are used for intercity highway transportation and carry heavy loads and operate at high speed.

The compression in an engine varies with the opening of the throttle and the speed attained. So in the case of a bus or truck driven in town, there will be little chance to open the throttle wide for any length of time, to get the full benefit of the high compression of the engine. If the same vehicle is run in the open country at a sustained high speed, the explosive temperature will be far higher than in the previous case and the revolutions of the engine will double or treble. For such service spark plugs have to withstand a higher combustion gas temperature and dissipate several times more calories, due to the increased number of explosions per minute resulting from the higher speed.

If a bus or a truck operating on long runs at fast speed is equipped with the same type spark plug as a bus or truck in city service, it will be difficult for the plugs to stay cold enough to prevent pre-ignition. A cooler constructed type of plug which will withstand more heat should be used in such a case. Weather temperatures have an important bearing on spark plug service. Spark plug recommendations as shown on specification charts are based on average operating conditions but to get maximum service from abnormal driving conditions, a spark plug must be obtained that is suitable for the particular condition involved.

## High-Speed Portable Electric Drill

TO MEET a growing demand for a higher speed light-weight ¼-in. portable electric drill the United States Electrical Tool Company, Cincinnati, Ohio, has two in regular production. One of these, known as the ¼-in. special direct drive drill, operates directly on the armature shaft at a speed of 10,000 r.p.m. and weighs only 4 lb. The other, known as the ¼-in. special gear reduction drill, operates at 2,000 r.p.m. and is only ⅛-lb. heavier.



**New ¼-in. portable electric drill**

New features on these drills include keyless chucks and easy accessibility to close places. Both have universal motors that operate on either alternating or direct current.

## Light-Weight Headlining

A NEW headlining with an aluminum face is announced by the Haskelite Manufacturing Corporation, Grand Rapids, Mich. The new product is made of Haskelite plywood faced with aluminum and results in a much stronger headlining with less weight than the usual materials employed.

The new lining consists of No. 27 gage aluminum sheet glued to a three-ply back of Haskelite plywood. The plywood recently developed has two faces of $\frac{1}{32}$-in. spruce and a $\frac{1}{32}$-in. poplar core, but walnut and mahogany can also be used for backs. The total thickness of the aluminum-Plymetl, including the aluminum, is 0.108 in. and the weight factor is 0.510 as compared with 0.715 for No. 16 gage aluminum which is ordinarily used. The stiffness of the new headlining is also much greater.

With No. 16 gage aluminum, the stiffness factor is 109.6 while that of the aluminum-Plymetl is 375 longitudinally and 145 transversely.

# American Association News

## Engineering Standing Committees Complete

STANDING committees of the power, purchases and stores, rolling stock and the way and structures divisions of the Engineering Association have been completed. These are the continuing groups which have charge of the committee work of the four principal divisions of the association. The personnel follows:

### Power

W. E. Bryan, superintendent of power St. Louis Public Service Company, St. Louis, Mo., chairman.
W. H. Bassett, Waterbury, Conn.
L. W. Birch, Mansfield, Ohio.
C. A. Butcher, East Pittsburgh, Pa.
H. A. Kidder, New York, N. Y.
John Leisenring, Springfield, Ill.
J. F. Neild, Toronto, Ont., Canada.
F. W. Peters, Schenectady, N. Y.
W. J. Quinn, New York, N. Y.
J. L. Ross, Pittsburgh, Pa.
Dwight L. Smith, Chicago, Ill.
L. J. Turley, Los Angeles, Cal.

### Purchases and Stores

A. A. Ordway, Boston Elevated Railway, Boston, Mass., chairman.
John Y. Bayliss, Richmond, Va.
A. S. Duncan, East Pittsburgh, Pa.
A. L. Fischer, Cincinnati, Ohio.
J. Fleming, Washington, D. C.
B. W. Forkner, Mansfield, Ohio.
A. E. Hatton, Pittsburgh, Pa.
F. A. Jordan, Atlanta, Ga.
E. A. Murphy, Indianapolis, Ind.
W. E. Scott, Philadelphia, Pa.
C. Thorburn, Los Angeles, Cal.
W. J. Walker, Schenectady, N. Y.

### Rolling Stock

A. T. Clark, superintendent of rolling stock and shops United Railways & Electric Company of Baltimore, Baltimore, Md., chairman.
R. S. Bull, Pittsburgh, Pa.
V. W. Berry, Richmond, Va.
C. Bethel, East Pittsburgh, Pa.
W. C. Bolt, Chelsea, Mass.
J. M. Bosenbury, Springfield, Ill.
James A. Brooks, Philadelphia, Pa.
M. R. Hanna, Erie, Pa.
J. S. McWhirter, New York, N. Y.
A. D. McWhorter, Memphis, Tenn.
T. H. Nicholl, Anderson, Ind.
R. B. Smyth, Boston, Mass.

### Way and Structures

E. M. T. Ryder, way engineer Third Avenue Railway, New York, N. Y., chairman.
C. A. Alden, Steelton, Pa.
C. H. Clark, Cleveland, Ohio.
E. B. Entwisle, Johnstown, Pa.
C. L. Hawkins, St. Louis, Mo.
William G. Hulbert, Easton, Pa.
John R. McKay, Fort Wayne, Ind.
C. A. Smith, Atlanta, Ga.
A. T. Spencer, Montreal, Que., Canada.
J. H. Sundmaker, Cincinnati, Ohio.
F. B. Walker, Boston, Mass.
Oscar Williams, Pittsburgh, Pa.

# Aluminum and Its Alloys in Car Construction

**Material saving in weight and no indication of corrosion have been shown in 368 cars built for steam railroads and 108 for electric railways, largely of aluminum or its alloys**

ONE of the features of the meeting of the metropolitan section of the American Electric Railway Association, held in the Engineering Societies Building in New York, on Oct. 5, was an address on "Aluminum and Its Use in the Transportation Industry." The speaker was Dr. Paul V. Faragher of the Aluminum Company of America. After giving an account of the methods of producing aluminum and its alloys, particularly duralumin, he gave a list of the cars for steam and electric railroads in which these materials had been used extensively. The list follows:

Illinois Central Railroad has 25 cars that were built in 1923 for its Chicago Terminal. The outside roof sheets, doors, interior finish sheets, conduit and junction boxes are of aluminum. The total weight of each car is 87,500 lb. and the weight saved, 4,700 lb. The service given has been suburban, three years with steam and two years with electricity. The condition of the aluminum is satisfactory, with no indication of corrosion. In addition, the same company has 215 cars that were built in 1926, the same parts as before being of aluminum. The total weight of the motor cars is 140,000 lb. and the weight saved, 10,150 lb. The total weight of the trailer cars is 88,700 lb. and weight saved, 7,763 lb. These cars have been in electric suburban service for two years. Here also the condition of the aluminum is satisfactory.

Pennsylvania Railroad has eight cars built in 1926 for its Paoli suburban branch. Here the entire superstructure except the belt rail is of aluminum. The total weight of each car is 111,270 lb., and the weight saved, 16,100 lb. These cars have been in electric suburban service for two years. Here the condition of the aluminum is satisfactory, the only corrosion being due to the welding flux left on after the roof sheets were welded. There is no indication of atmospheric corrosion.

Chicago & Northwestern Railroad had 120 cars built in 1927 for its Chicago suburban service. The exterior roof sheets, side girder and letterboard sheets, interior finish, bulkheads, doors and all miscellaneous sheets are of aluminum. The total weight of each car is 98,300 lb. and the weight that was saved 7,000 lb. These cars have been one year in steam suburban service. The condition of the aluminum is satisfactory, and there is no corrosion.

Cleveland Railway had one car built in 1926. All metal in the car with the exception of the side sills, wheels, axles, springs, bolts, rivets and similar material is of aluminum. The total weight of the car is 30,300 lb. and the weight saved is 12,901 lb. This car has been in city service for two years, covering during that time approximately 80,000 miles. Part of the time it has drawn a trailer. The condition of the aluminum is satisfactory.

Chicago & Joliet Electric Railway has one car, built in 1927. All metal in the car body and equipment is of aluminum with the exception of the bolts, rivets and similar parts. No aluminum was used in the trucks. The total weight of the car is 23,722 lb. and the weight saved, 11,500 lb. This car has been one year in city service, covering approximately 40,000 miles. The condition of the aluminum is satisfactory, with no corrosion.

United Railways of St. Louis has one car, built in 1927. Aluminum is substituted in the underframe and car body for steel, with the exception of the bolsters and miscellaneous minor parts such as bolts, rivets, etc. The weight of the car is 32,000 lb. and the weight saved, 5,332 lb. This car has been in service for one year, covering approximately 30,000 miles. The condition of the aluminum is satisfactory with no corrosion of any kind.

Montreal Tramways has ten cars, built in 1927, using aluminum in place of steel for all underframe members and metal work in the car with the exception of bolts and rivets. There is no aluminum in the trucks. The weight of the car is 37,100 lb. and the weight saved, 3,700 lb. This car has been in normal street car service in Montreal for one year. The condition of the aluminum is satisfactory, with no corrosion. The company also had 40 cars built at the same time as the one mentioned, in which aluminum replaced sheet steel in the body only. The total weight of each of these cars is 35,900 lb. and the weight saved was 1,200 lb. Here the condition of the aluminum is satisfactory. The same company had 30 cars built in 1928 with the same aluminum as in the above 40 cars.

Twin City Rapid Transit Company, Minneapolis, Minn., had 25 cars built in 1927 in which aluminum was used for all metal work except the underframes. The total weight of the car is 27,670 lb. and the weight saved was 2,618 lb. These cars have been in city operation for one year in Minneapolis and St. Paul. The condition of the aluminum is satisfactory with no indication of corrosion.

Pittsburgh Railways has two trucks, built in 1927, with aluminum used for all parts except the arch bars. The total weight of each truck is 1,100 lb. and the weight saved was 856 lb. These trucks have been in service for one year under street cars in Pittsburgh. The condition of the aluminum is satisfactory with no indication of corrosion.

Commenting on the future possibilities of light metals, the speaker said that the only means of producing structural sections in aluminum and its alloys up to the present time has been by the exclusion process, by which only small sections have been available. It is expected, however, that in a mill now under construction it will be possible to produce large structural plates by rolling, and in the not too distant future to be able to roll a channel 85 ft. long.

# News of the Industry

## Buffalo Fares Before Court

Federal Judge John R. Hazel in United States District Court at Buffalo has reserved decision on the application of the International Railway, Buffalo, for permission to amend its bill of complaint filed in 1926 to increase its fares in Buffalo, Niagara Falls and Lancaster. The court also reserved decision on the counter motion of the city of Buffalo to dismiss the original complaint on the grounds that it is not within the jurisdiction of the federal courts and should be referred to the New York State Public Service Commission.

Henry W. Killeen, appearing as counsel for the railway, told the court that the action was brought into the Federal District Court mainly because the Public Service Commission had previously refused to make a valuation of the company's property. He charged that the utilities board had done this in face of adverse decisions of the Supreme Court. The company also contended that the present rates of fare are confiscatory and under the constitution it has a right to bring its case before the federal court rather than before a regulatory body like the Public Service Commission.

The International Railway seeks to charge a 10-cent fare on local lines within the city of Buffalo instead of the present fare of three tokens for 25 cents, and to increase local fares in Niagara Falls and Lancaster from the present rate of 5 to 8 cents, with two tokens for 15 cents.

Russell B. Burnsides, representing the Public Service Commission, opposed the efforts of the railway to bring the fare case into the Federal District Court. He pointed out that since the original complaint was filed with the utilities board, fare increases have been granted in Tonawanda, North Tonawanda and Lockport. He said that as far as Buffalo is concerned the commission has granted the company an increase and this higher fare has been acceptable to the company and that no application has been filed by the company with the commission to review the need for another fare increase.

## Hearings on Electrification in Atlanta Expected

One hearing has been held in Atlanta, Ga., on the proposed electrification of main trunk line railroads now operating into that city and others are to be held in the near future by the bridge committee of the Atlanta City Council. Representatives of railroads and interested citizens are to be permitted to present their views on the ordinance intended to eliminate the smoke nuisance in the downtown section. Electrification of the roads in the downtown section has been under consideration for some time. It is hoped that some tentative plan will result from the present conferences.

## Rochester Line Reduces Price of Books

The Rochester & Eastern Lines of the New York State Railways, Rochester, N. Y., has announced reductions on the suburban line. The reductions concern both the 54-trip commutation books, which are good for 32 days, and the 46-trip school ticket books, which are good until used except during the months of July and August. The proposed reduction will effect a saving of from $1 to $20 per book. The change in commuters' rates is an experiment and the volume of traffic under the reduced fare will be checked to see if commuters actually take advantage of the cheaper rates.

## Without Jurisdiction to Approve Purchases

The item was in error which was published in ELECTRIC RAILWAY JOURNAL for Oct. 27, page 778, to the effect that the Ohio Public Utilities Commission had ruled that no contracts involving the lines of the Youngstown Municipal Railway may be entered into without the approval of the local city street railway commissioner. As a matter of fact, the issue did not come before the commission, and it has no jurisdiction over such matters, which under the home rule situation in Ohio come under the jurisdiction of the City Council. Neither was such decision made by any court, commission or official of competent jurisdiction.

The issue was raised by the local street railway commissioner at Youngstown before the City Council and was referred by that body to the City Law Director and the Council's railway committee. The Law Director at the meeting of the Council on Oct. 29 rendered a written opinion in which he ruled that the city street railway commissioner did not have authority to approve purchases.

The Youngstown Municipal Railway franchise in Youngstown does not give the commissioner any such right to approve purchases and the commissioner has never exercised any such prerogative. To do so would, of course, place the commissioner, a political appointee, in the position of purchasing agent of the company without any responsibility to the management or to the owners.

## Final Plea for Approval of Omaha Franchise

The proposed franchise for the Omaha & Council Bluffs Street Railway, Omaha, Neb., will be voted upon at the general election on Nov. 6. The terms of the franchise were agreed upon after long study by the city commissioners and the city's corporation counsel. The franchise in full is being published as a paid advertisement in the newspapers so that every phrase and every clause and every sentence can be studied at leisure. In a final word on the matter the company says:

In every way, the people of Omaha have been safeguarded and their rights preserved. The company is content with the terms, provided the franchise is approved, for approval is needed if the railway of Omaha is to be permitted to extend its financing and develop its property.

We have been told by many people that our efforts to make the service suit the needs of the city, our efforts to give courteous, efficient, regular tramway service, are appreciated. We believe that an efficient railway system is one of the biggest assets a city can have.

We know that traffic and transportation engineers agree that trolleys cars propelled on fixed routes over steel rails must ever be the backbone of any city's transportation system. We know nothing comes so near the daily routine of the worker and the shopper as the street car.

We ask Omaha to approve the proposed franchise. We pledge Omaha, at all times, the very best street car system it is possible to give; the best, the safest, the most courteous, the most efficient.

Reference is made elsewhere in this issue to the free bridge proposal before the voters.

## Riding Holds Up in Hamilton

Three months' experience with a higher fare in Hamilton, Ontario, has shown no decrease in patronage, according to the Canadian *Financial Post*, which recently described the fare and jitney situation in the city. The railway, operated by a subsidiary of the Dominion Power & Transmission Company, was authorized in a recent finding of the Ontario Railway & Municipal Board to provide for a cash fare of 7 cents, four tickets for 25 cents and children's fares at ten tickets for 25 cents and to provide a new wage scale. Reference was made in these pages at that time to another live topic, the jitney. A lower court had declared that the jitneys were operating illegally and that pending the findings of this court on an appeal they continued to operate. The Dominion Power is contending that it has an exclusive franchise for carrying passengers, other than in taxicabs, within the city limits. Meanwhile the jitneys continue to operate.

## New Fare Schedules on Schenectady Line

A new joint passenger tariff for the Schenectady Railway in connection with United Traction Company and Capitol District Transportation Company, Inc., provides for sale and use of a twenty-coupon school ticket good between Schenectady and Albany, N. Y., and between Schenectady and Troy for $5. It also provides joint ticket fares of 50 cents one way and 84 cents round trip, between Schenectady and Albany and between Schenectady and Troy.

At the same time the Schenectady Railway has had cancelled its joint 50-trip commutation ticket fare in connection with the United Traction Company and Capitol District Transportation Company, Inc., between Albany and Schenectady, Stanford and Van Heusen and between Troy and Schenectady, Morgan Avenue and Niskayuna. These changes are effective Nov. 18, 1928.

Provision has also been made on the Schenectady Railway line for sale and use of a twenty-coupon school ticket book, good between Schenectady and Ballston Spa for $5, and a like book between Schenectady and Saratoga for $7. New ticket fares effecting reductions from cash fares are in force between Schenectady and Ballston Spa, and between Schenectady and Saratoga. The time limit on commutation tickets (50-rides) has been changed from 30 to 60 days from and including date of sale.

## San Francisco Protests Trade Commission's Act

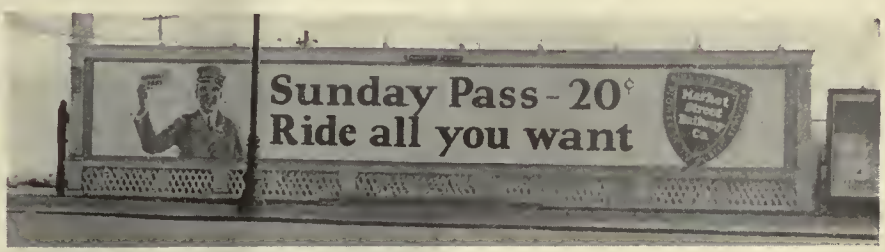
The Federal Trade Commission, through its local representatives in San Francisco, Cal., has requested the Citizens' Transportation Committee to open its campaign receipts and expenditures to their inspection. This request has been denied. Furthermore, President Coolidge has been requested by the San Francisco Chamber of Commerce to direct the Federal Trade Commission to confine itself to matters over which it has jurisdiction and not to interfere with the local political battles. The president of the chamber declared that the commission's action in directing its local agents to inquire into the activities of the Citizens' Transportation Committee and the various organizations sponsoring charter amendment No. 24 is "strongly and widely resented." The president, Mr. Fay, said:

This demand of the Federal Trade Commission has been given wide newspaper publicity here for purely propaganda purposes. We wish to protest to you this interference by an agency of the federal government in a matter of a local election on a question of purely local concern to San Francisco. The attempted interference by the Federal Trade Commission in a matter that does not concern the federal government in any way is strongly and widely resented. We accordingly request that appropriate action be taken to direct the representatives of the Federal Trade Commission to confine themselves to matters over which the Federal Trade Commission has jurisdiction.

Vice-President Burt Hamerstrom of the Market Street Railway, in answer to Supervisor Havenner's statement that the company's expenditures for advertising and publicity had jumped from approximately $5,000 in 1925 to $70,000 in the last year, freely admitted the figures. He said:

When the present régime took over the direction of the Market Street Railway, it was agreed that the receipts must be increased. Two ways naturally suggested themselves. The first, to raise fares, was rejected as it might have resulted in a decrease because of public resentment. The other method was adopted. This plan is simply to sell our service. We realized that to get satisfied patrons we must give good service, so considerable money was expended on improvements, elimination of rough crossings, new easy riding cars and other things. Then we used the newspapers to tell the people about it. We also advertised in our cars. The results have proved that we adopted the right method to sell our service to the public. Not one word of politics has been printed in our advertisements.

### Popular Selling Appeal in San Francisco




Approximately 11,000 persons are now using the Sunday pass

## Commission Receives Demands of Indianapolis Men

Union employees of the Indianapolis Street Railway, Indianapolis, Ind., carried their demands for increased pay and changed working conditions to the Indiana Public Service Commission on Oct. 24, through their attorney Frank P. Baker. The employees, members of the Amalgamated Association, ask for a basic wage of 56 cents an hour, instead of the present 40 cents an hour. Under the present agreement the carmen receive the base pay for the first year and and increase of 1 cent an hour each year for five years, when the maximum pay of 45 cents is attained. The demands are for 56 cents for the first six months, 58 cents an hour the next six months and 60 cents an hour for all periods over one year of service.

The demands were presented first to James P. Tretton, superintendent of the company, and then to Joseph A. McGowan, acting president, both of whom rejected them. Mr. McGowan informed the representatives that the company's earnings did not justify a salary increase at this time.

## Taxi War in Muskegon

Muskegon has been added to Cleveland, Columbus, Louisville, Washington and other cities in which taxi companies have warred among themselves or cut prices and sometimes done both. Three weeks ago a local company appeared on the field to contest with the Yellow cab, formerly the only servce in the city. The new company announced a unit price of 25 cents anywhere in Muskegon, 50 cents to Mukegon Heights or North Muskegon, and 75 cents to Lake Michigan Park. The Yellow cab was forced to meet the competition, coming down to 20 cents for Muskegon and cutting to the competitor's scale to other points. On Oct. 25 the Checker Cab Company entered the fray at 20 cents for Muskegon and 5 cents lower to the other cities than the scale above. There is no charge for extra passengers, so workmen band together, call a cab and are driven to work for about 5 cents each. Mothers send children to school via cab, and one company is using the cabs for errand service.

## Indiana Commission Starts Its Stand on Mergers

The Indiana Public Service Commission issued a statement recently seeking to justify its stand against the merger of certain utility properties during the last few months. The statement said:

The commission has no hesitancy in saying that if the public is to be protected against undue and unreasonable rates, greater scrutiny must be given in the future to purchase and sales and consolidations. The commission believes that the present tendency toward consolidation of purely local utilities into larger corporations in many instances is adverse to public interest. The commission believes that close local contact with the controlling authorities of utilities is more conducive to good service and reasonable rates.

The commission is of the opinion that utility rates generally are too high. It is determined to remedy this situation. The commission insists on its lawful right to approve or disapprove matters that come before it for sanction in the light of all evidence which it has, bearing on such matters.

Speculation in utility properties within this state has been very pronounced in the last few years. It is very clear to the commission that the tendency to inflate purchase and sales prices of utilities is a result of undue speculative activity. Purchase and sale price is used as a basis of security issues and becomes a factor in establishing fair value, which in turn determines rates. The commission cannot hope successfully to control rate making or the issue of securities if the present speculative activity among utilities is not more effectively controlled.

Oftentimes unreasonable prices are paid for utilities. So long as valuations, security issues and rates keep pace with advancing purchase and sale prices, this practice will continue. A process of this kind is clearly adverse to public interest. The control of such matters is delegated by law to this commission. This commission feels it to be its duty to curb undue speculation in utilities within this state.

## Committee on Unification in New York

The first concrete action on the transit unification plans proposed by Samuel Untermyer, special counsel for the New York Transit Commission, and Comptroller Charles W. Berry was taken on Oct. 23 by the Board of Estimate when Mayor Walker announced the appointment of a committee to study the projects and report to the board in four weeks. The committee consists of the Mayor, Joseph V. McKee, president of the Board of Aldermen, and Mr. Berry.

The Untermyer plan was submitted to the Board of Estimate last July. The Berry plan was made known in January.

Following are the main features of the Untermyer proposal:

Municipal ownership, with 5 cents as the "basic" fare.

Operation of the unified lines by a public corporation to be organized and owned by the city.

Existing lines to be acquired and new lines to be built with the bonds of this corporation, to be tax exempt and to be secured by a requirement that the fare must be raised if no other way of earning carrying charges can be found.

Existing lines to be acquired either by purchase or recapture, but probably by purchase of the B.-M.T. and recapture of the I. R. T.

No surface lines or buses included.

The directors of the corporation to be four city officials ex-officio and fifteen members appointed for ten-year terms, to escape political influence.

By use of corporation bonds instead of city bonds, the debt limit would be freed of the subway burden and the city left free to use its credit for building schools, etc.

The feature of the Berry plan which aroused greatest interest at the time of its proposal is the provision for a three-year trial of the 5-cent fare, with a referendum on the question after that period, if necessary. The plan would abolish the present Transit Commission and would set up a new transit authority similar to the Port of New York Authority to take over the unified system and lease it to an operator.

The plan provides that the transit authority shall consist of five or six commissioners to be appointed by the Mayor with the approval of the Board of Estimate. The new Authortiy would be expected to bring about the unification within a year. The plan provides also for limitation of the profits of the operating company and for ultimate ownership of the transit lines by the city when the securities listed in payment of the properties of the B.-M.T. and the Interborough, in case they shall have been purchased, have been retired.

# Division of McGraw-Hill Executive Leadership

**James H. McGraw continues as chairman of the board. Malcolm Muir elected president. Changes, in line with current expansion, take effect at once**

RECENT growth and expansion of the McGraw-Hill Publishing Company have led to action by the board of directors, it was announced on Nov. 1, separating the offices of chairman of the board and president of the company, both of which have hitherto been held by James H. McGraw. Under the new plan of organization Mr. McGraw will continue as chairman of the board. Malcolm Muir, formerly vice-president, has been elected president of the company and chairman of its executive committee. James H. McGraw, Jr., vice-president and treasurer, has been elected vice-chairman of the board and chairman of the company's newly-created publishing committee.



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Malcolm Muir

Through merger and purchase in recent months the McGraw-Hill Publishing Company now comprises nine subsidiary and associated companies publishing business and industrial magazines, engineering books, catalogs and directories. Twenty-four magazines serving ten fundamental industries and covering business broadly are published at such widely distant points as New York City, Chicago, San Francisco and London. The direct effect of this coordination of related publishing interests will be to enhance publishing facilities for the group as a whole beyond those which any single paper or lesser group might enjoy. At the same time, the official announcement of the board of directors points out, these developments have greatly multiplied executive responsibilities and have necessitated a readjustment of the administrative duties of the company's principal officers.

Mr. Muir will be the chief executive of the McGraw-Hill Publishing Company, with full authority and responsibility for the operation of the company's business. He has been with the organization for the past 23 years and has been identified with many phases of its activities. During the past ten years particularly he has taken an active part in each step of the company's growth. He has been a leader in the work of the Associated Business Papers, serving as president in 1925-1926, and has been an important factor in raising the publishing standards of the business papers.

## $1,200,000 Duboce Tunnel Opened in San Francisco

A celebration marked the official opening of the Duboce Tunnel on Oct. 22 and the inauguration through it of street car service over the new "N" line of the San Francisco Municipal Railway. Construction on the project had been under way since June, 1926.

To Mayor James Rolph fell the honor of piloting the first car. The motorman's cap he wore was more than a decoration. It was a badge of performance, for he actually piloted the car without assistance for 1½ hours—down Market Street from Duboce Avenue to the ferry, back through the tunnel and down to the ocean. His conductor, also garbed in regulation carman's attire, was Mrs. Minnie White.

The tunnel is approximately 4,200 ft. long, is double tracked and has a width of 25 ft. It was built at a cost of $1,200,000, while the car line cost an additional $600,000.

## Eight Cents Authorized in Shreveport

In a decision handed down on Oct. 19 the Louisiana Public Service Commission denied the 10-cent fare rate requested by the Shreveport Railways, Shreveport, La., but authorized an 8-cent rate which is an increase of 1 cent over the present rate. The new ruling requires the company to sell books at the rate of eight for 60 cents, or 7½ cents each. Fares for children are retained at 3½ cents instead of the 4-cent rate requested.

The order terminates an issue which dates back to February, 1928, when the company applied to the commission for a 10-cent cash fare with a weekly permit card, three tickets for 25 cents and 4 cents for school children. After

several months characterized by inaction, injunction hearing, adjournment and continuation the attorneys requested the United States Court to grant a further extension until Sept. 17 to give the commission sufficient time to consider the petition.

Capt. H. B. Hearn, president of the company, announced some time ago that the company's net earnings last year were $69,634 "on a property investment valued by eminent utilities engineers to be $2,804,884 at a minimum." After noting deductions of $51,037 for interest on borrowed money, the statement continues, the company had $18,597 left for improvements or to apply to dividends.

The various steps in this situation have been covered previously in these pages.

## Jitneys Driven Off Detroit Streets

Jitney operation on streets in Detroit, conducted for the past six years under the protection of a series of injunctions, has been terminated by the police department acting under a decision of the Michigan Supreme Court. The jitney ordinance was signed by Mayor Couzens on May 29, 1922. It became effective the following October. On Oct. 24 the Michigan Supreme Court, in a majority opinion, upheld the validity of the ordinance and indicated that further legislation aimed to delay enforcement would not be tolerated. The ordinance in question prohibits the operation of jitneys on Fort Street East and West, Michigan Avenue, Grand River, Woodward Avenue, Jefferson Avenue, Cass Avenue, John R. Street and the parks and boulevards.

In order to provide transportation for passengers who formerly used the jitneys all available street cars and buses belonging to the municipal system have been thrown into service and buses and cars have been rented from the Eastern Michigan Railways, formerly the Detroit United Railway. Moreover, 30 street cars and trailers have been rented from the Cleveland Railway. They were run to Detroit over the connecting interurban lines.

The Supreme Court's opinion was handed down on the city's motion to dismiss the bill of complaint of the Red Star and the Blue Ribbon Jitney Drivers' associations. The court also took up the city's appeal asking for a writ of mandamus to compel Circuit Judge Clyde Webster to dismiss his injunction under the protection of which the jitneys were operating. The court opinion stated that with the dismissal of the bill, the injunction based upon the bill goes down with it. The order dismissing the writ was signed by Judge Webster when presented by the Corporation Counsel, leaving the city free to enforce the ordinance.

Edward N. Barnard, counsel for the jitney drivers throughout the long fight against the city, stated that the members of the jitney associations were willing to submit to any reasonable regulation. to operate under the direction and control of city authorities, to furnish any bond or surety and to comply with all requests of the city.

Del A. Smith, general manager of the municipal system, said there may be places in the city where supplemental service will be necessary. It is expected that within a week or so surveys will be completed indicating just where help is needed.

The first of the 50 new street car type buses which are being purchased from the American Car & Foundry Company, Detroit, will be delivered within a week and will be put into service immediately.

A de luxe bus service is being planned for Grand River and Woodward Avenues by the Street Railway Commission. It is expected that the first of a fleet of 30 16-passenger Graham-Paige buses, will soon appear on these lines. These buses were ordered by the commission after the jitneys were driven off the streets. No standing passengers will be permitted. The rate of fare to be charged on these buses has not been determined.

# More Moves in Chicago Negotiations

### City and company engineers disagree over financial set-up in proposed ordinance. Another suggestion made by Lisman group

REPRESENTATIVES of the Chicago Surface Lines and the Chicago Rapid Transit Company, meeting during the week ended Nov. 3 with the City Council's local transportation sub-committee, agreed to revise the financial estimates recently submitted by company engineers in the negotiations for a new unified transit ordinance. The estimates of the engineers were interpreted by the Aldermen as making necessary a fare of 11½ cents on surface and elevated lines by 1948 in order to yield the companies the return which they are asking.

As estimated by Major R. F. Kelker, Jr., the subcommittee's engineer, in the tentative draft submitted to the companies a few weeks ago, the fare in 1948 would be 7 cents on both surface and elevated lines, under the operation of the proposed ordinance.

### New Financial Estimate Promised

When, after hearing the results of Major Kelker's conference with the traction engineers regarding a financial basis for the new ordinance, several Aldermen moved that the city break off all further negotiations with the companies and call in outside capital. Officials of the two systems contended that their engineers had no authority to decide the provisions desired by the companies and promised to furnish a new financial estimate.

The fares which the company engineers held to be essential to meet the desired return and the fares as incorporated in the committee's tentative ordinance, compare as follows:

RATES OF FARE

| | Company Plan | | City Plan | |
|---|---|---|---|---|
| | Surface Cents | Elevated Cents | Surface Cents | Elevated Cents |
| 1929 .... | 7½ | 10 | 7 | 8½ |
| 1935 .... | 9½ | 10 | 7 | 8½ |
| 1937 .... | 10 | 10 | 7 | 8½ |
| 1944-48... | 11½ | 11½ | 7 | 7 |

While it is now believed that the companies will accept virtually all of the financial arrangements upon which the committee's franchise plan is based, they will insist, however, in their demand that the return on the capital values of the present companies and on new capital, shall not fall below 6½ per cent, plus one mill for every revenue passenger carried. This stand, Major Kelker pointed out, accounts for the wide difference between the financial plan evolved by the committee and that of the companies. In the committee's set-up the return allowed to the company is 5½ per cent and only upon the initial capital value of the company. A camparison of the two estimates follows:

| | Company Plan | City Plan |
|---|---|---|
| **GROSS RECEIPTS** | | |
| 20th year .... | $194,700,000 | $119,100,000 |
| 40th year .....not estimated | | 155,850,000 |
| **COST PER PASS CARRIED** | | |
| 20th year .... | 9.15 Cents | 5.45 Cents |
| 40th year .....not estimated | | 5.45 Cents |
| **RENEWALS** | | |
| Contemplated Expenditure (20 years) .....$331,129,000 | | $129,742,000 |
| Per Cent of present value of property ($258,000,000) ..... | 128 per cent | 50 per cent |
| **COMPANY'S RETURN** | | |
| Total .....$566,299,000 | | $336,946,000 |
| Average per year. | 28,314,950 | 16,847,300 |
| **CITY'S RETURN** | | |
| Total ..... | $48,266,000 | $196,675,000 |
| Average per year. | 2,411,300 | 9,833,750 |
| Portion of city's share used for reduction of fares | 4,137,000 | 27,754,000 |
| **CAPITAL INVESTMENT** | | |
| Initial capital value .....$258,000,000 | | $258,000,000 |
| Extensions ..... | 235,000,000 | 235,000,000 |
| Renewals ..... | 98,600,000 | ..... |
| Totals .....$591,600,000 | | $493,000,000 |

John M. Harlan, attorney for the Lisman group of New York bankers which submitted a plan for a 20-year franchise nearly two years ago, suggested to the local transit sub-committee during the discussion of the respective financial plans that both his clients and the present traction systems be asked to submit in detail the best ordinance that they can on the same day, pointing out that if the Aldermen made it clear that no other plan would be considered after that date each bidder would make every effort to submit a better ordinance than the other. Both of these plans then could be passed on to the City Council and submitted to the voters.

## Bridge Line Bought by City

**New York to substitute buses for present Manhattan Bridge service. Through service on Williamsburg span**

ACQUISITION of the Manhattan Bridge Three-Cent Line by the city of New York was approved by the Board of Estimate on Oct. 25. The price to be paid is $206,760. This is $21,340 more than the franchise and the equipment of the company could have been bought for two months ago, when the outfit was offered to the city at $184,420.

While the board was thinking about the proposition, prompt acceptance of which was urged by Borough President Byrne of Brooklyn, the transit commission ordered improvements to be made on the 3-cent line. The cost of these improvements must now be borne by the city, but they will be removed along with the rest of the equipment to make room for additional vehicular traffic lanes on the bridge.

Representatives of the Brooklyn Chamber of Commerce and the East Side Chamber of Commerce in Manhattan, appeared to oppose discontinuance of the 3-cent line unless buses were to be substituted as soon as trolley operation ceased. The 3-cent line is operated between the Flatbush Avenue Extension in Brooklyn and lower Manhattan over the Manhattan Bridge. It has been indicated that the bridge runway now occupied exclusively by tracks of the railway will be converted to a roadway for motor vehicles thus increasing the vehicular capacity of the bridge, long since exceeded at certain hours of the day.

Mayor Walker promised that buses would succeed the cars, but no action in the matter was taken by the board. The bridge commissioner said he could put on emergency buses until a franchise can be granted for the permanent right-of-way to replace the railway.

Another development of considerable interest was the indication by Bridge Commissioner Goldman that he would soon be in a position to recommend to the Board of Estimate abolition of the local line on the Williamsburg Bridge and the restoration of through service by the Brooklyn-Manhattan Transit Corporation. This through service over the Williamsburg Bridge was discontinued on the day early in Mayor Hylan's administration when the city took over the local bridge line for municipal operation.

Mr. Goldman explained that the Brooklyn-Manhattan Transit Corporation wanted the city to advance $180,000 to meet the expense of a rearrangement of the tracks which would be necessary before through service could be restored, but that thus far he had not been able to agree with President Menden of the railway on that point. Mr. Goldman indicated that he expected some sort of compromise would be effected. For more than five years the East Side Chamber of Commerce has kept up its fight for the restoration of through service over the Williamsburg Bridge. Bankers, merchants and manufacturers were in the group that appeared before the Board of Estimate to urge the Mayor and his associates not to delay the installation of through service.

## Mr. Young's Speech Distributed in Baltimore

Copies of the address made by Owen D. Young before the American Electric Railway Association in Cleveland on Sept. 25 have been printed in pamphlet form by the United Railways & Electric Company, Baltimore, and are being distributed by that company. The pamphlets are accompanied by a letter signed by C. D. Emmons, president of the company, who states that in Baltimore the street cars carry 75 per cent. of the people going to and from business. Mr. Emmons says:

Charging the company with the cost of repairing and repaving streets, relics of days when horse cars destroyed pavements, the 9 per cent tax designed to support the parks, once most frequently used by our car riders now used principally by motorists, who pay no park tax—these and other items now charged to the company are of the character of "special charges" which Mr. Young protests should be abolished. They simply increase carfare and prejudice the people against the company, which must collect it.

Mr. Young's general conclusion was that without a proper carfare, cities will have to raise money for transportation indirectly but more expensively—namely, through taxation under public ownership.

### COMING MEETINGS OF *Electric Railway and Allied Associations*

***Nov. 8-9*—Iowa Electric Railway Association, operating meeting, Roosevelt Hotel, Cedar Rapids, Iowa.**

***Nov. 13-16*—National Association of Railroad and Utilities Commissioners, New Orleans, La.**

***Nov. 14*—Association of Electric Railway Equipment Men, Middle Atlantic States, semi-annual meeting, Hampton, Va.**

***Nov. 21-22*—Public Utilities Association of Virginia, Hotel Roanoke, Roanoke, Va.**

***Nov. 21-22*—Central Electric Traffic Association meeting, Auditorium Hotel, Cleveland, Ohio.**

***Dec. 10*—National Highway Traffic Association, annual meeting, Automobile Club of America, New York, N. Y.**

***Jan. 14-18, 1929*—American Road Builders' Association, convention and road show, Cleveland, Ohio.**

***Jan. 23-25, 1929*—Electric Railway Association of Equipment Men, Southern Properties, and Southwestern Public Service Association, Mechanical Division, joint meeting, Houston, Tex.**

## Bridge Controversy in Omaha

The Omaha & Council Bluffs Street Railway appears to be menaced by the action of the courts in Council Bluffs requiring the county board to submit a $400,000 bond proposition to join with Omaha in building a no-toll bridge across the Missouri River connecting both cities. Previously the board had refused. The county board in Omaha had already voted to submit an $800,000 bond issue as its contribution to the cost of the bridge.

In a full-page advertisement in the Omaha newspapers President Shannahan of the Omaha & Council Bluffs Street Railway has offered to sell the company's bridge to the public. He explains what will happen to street car service if the people of the two communities vote bonds to build a free toll bridge. He points out that the Council Bluffs line is merely under lease to the Omaha company. For thirteen years the bridge company was supported by revenues from the Omaha company, and during the last year the deficit in operation of the Council Bluffs company, counting taxes and bond interest, was $111,623. A similar situation now exists with reference to the Omaha company. The net revenues from the bridge alone the first nine months of this year were $231,539, while the deficit from the operation of the lines in Omaha was $100,650, that much less than enough to pay bond interest, without any dividends. The Omaha company pays $60,000 a year rental, and there is a $2,000,000 mortgage on the Bluffs property and bridge.

Mr. Shannahan says that the company recognizes the existence of a strong sentiment in favor of a free bridge, and that it will sell the bridge at its just and fair value. It suggests that the proposition can be handled in one of two ways, mortgaging the bridge tolls and allowing these tolls to pay for the structure until it is made a free bridge. The other would be to have the cities or counties issue bonds. This is objectionable because this would increase taxes on the railway.

He also makes it plain that the Omaha company is merely a tenant and that any sale made must be by the Council Bluffs company, which cannot pass a clear title without the consent of the Omaha corporation. He thinks that if the bridge is bought on a fair price basis bankruptcy can be avoided, but that this contingency is inescapable if a competing non-toll bridge is built. The money from the sale will be divided and used to reduce the interest charges of each company.

## Objects to New Service in Ohio

The Lake Shore Electric Railway, Sandusky, Ohio, has protested to the Ohio State Utilities Commission against application of the Moor Trucking Company for permission to operate trucks across Ohio from Detroit to Pittsburg. The railway says it is giving adequate service and that a motor line is unnecessary.

# Recent Bus Developments

## Ohio Bus Company Restrained by Court

Inter-terminal bus service between Alliance and Sebring, Ohio, a distance of 4 miles, served by the Sebring-Alliance Bus Company, has been terminated since the United States Supreme Court at Washington, D. C., has dismissed a plea from the bus company in its fight for an unrestricted certificate of operation. In this ruling the court sustained the Ohio Supreme Court. The Ohio court has issued its order to the Ohio Public Utilities Commission to revoke the old bus certificate and order operation under the new restricted permit.

Action of the courts and the utilities board is the result of charges made by the Stark Electric Railroad, Alliance, which operates between Alliance and Sebring. The electric railway contended the bus line was operating under an illegal certificate. Investigation resulted in the old certificate being revoked, but immediately the Ohio Public Utilities Commission issued a new certificate without restrictions. The case was carried by the Stark Electric to the Ohio Supreme Court, which ordered the Ohio utilities commission to grant a new certificate which would prohibit inter-terminal service.

The new permit allows the bus company to take on passengers at either the Alliance or Sebring terminals, but they must be discharged before the bus crosses the corporation limits of the other city. Passengers who board buses between the two places can ride to either terminal.

This restriction was opposed by the owners of the bus line. The plea for an unrestricted certificate was carried to the United States Supreme Court, but that request has been dismissed and the state court ordered to enforce its ruling.

## Fifteen-Year Franchise for Tulsa Operation

The City Commission of Tulsa, Okla., has adopted an ordinance making effective a fifteen-year franchise voted by the citizens Oct. 17, to the Union Transportation Company and the Berry Bus Line Company. The Union Transportation Company is under the same ownership and management as the Oklahoma Union Railway and these companies and the Tulsa Street Railway furnish street car and bus service in Tulsa. The Berry Bus Line Company supplies bus transportation to sections of the city that are tenanted largely by colored people.

The Union Transportation Company has a total investment of $500,000 in bus equipment. The company operates 80 buses wholly for city service, of which 55 are continually in use. An average of 22,000 persons ride the buses every day.

## Buses Will Not Solve Seattle Problem, Says Mr. Avery

Arrangement by the City Council of Seattle, Wash., of another loan of approximately $700,000 from the city light or city water department for the Seattle Municipal Street Railway system has been suggested by Councilman E. L. Blaine, chairman of the finance committee, as virtually the only means of enabling the railway department to meet bond interest and redemption payments due next March. Even this, it is declared, will afford only a temporary solution of the railway system's financial problem, leaving the city confronted by the necessity of working out, within the next few months, a complete refinancing and rehabilitation program for the entire car system.

George B. Avery, superintendent of public utilities, at the invitation of the Council, is now working upon detailed suggestions and proposals for the major program, which members of the Council estimate may entail the expenditure of approximately $5,000,000, and which may involve an extensive reorganization within the railway department as well as in operation of the service.

Mr. Avery said that buses would not and could not solve Seattle's transportation problem. Bus operation in Seattle had proved a poor but very expensive substitute for extended street car lines. The buses already operating in Laurelhurst were paying half the cost of their operation. Not one of the city's bus routes is paying. He saw the problem solved by various extensions to the railway lines, replacement of old rolling stock with new equipment, and general improvement of tracks.

Councilman Blaine said that of a loan of $650,000 made to the street railway department by the city light department about a year ago, all but about $100,000 will have been repaid before March 1, at which time the railway system must be prepared to pay $1,125,025 on bonds and interest. It is figured that current revenues of the system, averaging about $475,000 a month, together with a small reserve now on hand, will take care of operating expenses and provide the amount of money needed in addition to the $700,000 loan which is being contemplated.

Meantime, the City Council utilities committee has denied the petition of Beacon Hill residents for an extension of car service into their district. The Council will hold another hearing in about three weeks on the proposal, but before the time for that meeting it hopes to figure out a way to improve the service.

## Indiana Cities May Regulate Buses

Right of the city of Muncie, Ind., to control bus operation within its corporate limits has been upheld by the Indiana Supreme Court in a recent decision. The case was sponsored by Sumner B. Denny and a group of independent bus operators, with Arthur W. Brady, president and receiver for the Union Traction Company of Indiana, as defendant. The decision ends a protracted controversy between the railway and the independent bus operators and city officials of Muncie. The railway operates a bus line in the city under a certificate of convenience and necessity issued by the Indiana Public Service Commission.

The railway contended that it had the sole right to operate buses in Muncie, but the independent operators asserted that Muncie came within the purview of section 5 of the 1925 bus regulation law, which provides that cities already having bus service at the time the law went into effect retained control of the buses. Muncie regulatory laws were passed by the City Council there in 1926.

The Union Traction Company obtained an injunction at Muncie to prevent the independents from operating. The Supreme Court decision reversed the lower court's rulings in the matter, which had been decidedly in favor of the railway.

## Buys Stock of Pacific Coast Motor Coach

The Pacific Electric Railway, Los Angeles, Cal., has been authorized by the Railroad Commission to purchase all of the outstanding stock of the Pacific Coast Motor Coach Company, amounting to $45,000, and to take over the operation of that company.

## Express Car and Local Bus Working Out in Louisville

G. B. Powell, head of the bus department of the Louisville Railway, Louisville, Ky., in commenting on the combination bus and railway service on the Broadway line, by which the street cars became express cars, with local stops made by the buses, stated that the plan had worked out smoothly and was proving successful.

Prior to the recent installation of the bus service 28 motors and 14 trailers were used in handling the peak loads. Today the peak load is handled with 24 motors and 12 trailers, and normal day loads with 14 cars and no trailers. Fourteen buses carrying 29 passengers each are used on the line in making the local stops. The street cars seat 42 passengers.

Fare on buses or street cars is 7 cents, with single or double transfers made, as usual, plus the transfers to and from the buses, and the street cars of the same line.

# Financial *and* Corporate

## Broad Street Operation Results in Loss of $304,431

Analysis of the revenue statistics by the city, Philadelphia Rapid Transit Company, and commission experts comprising the Broad Street Subway Conference Board disclosed that the net income of the P. R. T. system had decreased $304,431 during September because of the subway operation. Of that total $200,000 represents the sum paid monthly by the P. R. T. to the city for operating privileges. Added passenger revenue brought into the P. R. T. system through the tube operation amounted to $24,000 plus $1,000 revenue from other sources. Also about $7,500 was saved in operating expenses on the surface system because of riding traffic diverted to the subway. Against the total gross revenue of $136,556 for the line during September, paid by 2,519,356 riders, there stands the $400,000 which the city and P. R. T. meet on an equal basis for fixed charges on the city bonds sold for construction of the line.

The report given out on Oct. 29 states in part:

It is obvious that the brief term of a 90-day lease makes impractical the expenditure necessary and the disturbance to the car-riding public attendant on such a general rerouting as would develop the maximum possible use of the subway, since such rerouting might be entirely reversed if the lease were not extended.

Broad Street subway carried during September 2,519,359 passengers. It operated 361,510 car miles and 27,569 car-hours. The normal week-day service provides a headway of five minutes during the middle of the day and four minutes during the peak hours, morning and evening. During the middle of the day three-car trains are operated, and during peak hours six-car trains are operated. During the present operation when City Hall station is used to somewhat greater proportional extent than will be the case when the subway is extended to South Street, one track has been planked over to supply additional platform space, and operation into and out of the station must be by single track.

Since this condition exists it may not be possible materially to reduce the intervals between trains below that stated. Present timetables call for the operation of 78 of the 150 cars supplied by the city. The reserve is obviously adequate for some time to come. Of the northbound passengers 769,727, or 61.2 per cent of passengers originated at the City Hall station, and 411,414 passengers, or 32.6 per cent, of the southbound passengers originated at the Olney Avenue station, indicating the large preponderance of long riders and through traffic.

The Engineering Committee of the Board was assigned the task of determining the passenger revenues which were brought into the P. R. T. system by reason of the operation of the Broad Street subway. Excerpts from this committee's report have been accepted by the board as expressing with substantial accuracy the passenger revenues which have been brought into the P. R. T. system by reason of the operation of the Broad Street subway.

Mayor Mackey said that the program he has in mind is to continue for two years the experimental operation of the Broad Street subway under lease to the Philadelphia Rapid Transit Company. The present lease dates from Sept. 1, is for three months, at a rental to be paid the city by the P. R. T. of $200,000 per month, plus the operating cost. Provision is made in this temporary lease for its extension beyond Nov. 30 from month to month. Some time in December, it is expected, a new lease for two years will be drafted, based upon the revenue received by the system during the three-months' experimental operation.

Before the expiration of the two-year agreement the South Broad Street section of the subway will have been in operation for almost a year, so that such data as to fares, operating cost and other expenditures will have been more definitely determined for the completed system in Broad Street. The Mayor has fixed Jan. 1, 1930, as the date for opening and operation of the tube south of City Hall to South Street.

## Roger Babson Buys Into Boston & Worcester

Roger W. Babson and associates are understood to have acquired control of the Boston, Worcester & New York Street Railway, the successor following foreclosure to the Boston & Worcester Street Railway. At the first meeting of the new board, which was held recently, it was voted to pay the 2½ per cent interest coupon on the 5 per cent reorganization mortgage bonds, which was deferred last May. The company is doing a little better than breaking even and is understood to be earning the interest charges on the funded debt. The outlook for the company's coach line is regarded as favorable.

# Loss on San Francisco Municipal $290,326

### Total passengers carried 85,281,171. Profit of $44,558 shown before allowing charter comparison charges that put system on a basis similar to private enterprise

FOR the fiscal year ended June 30, 1928, the Municipal Railway of San Francisco, San Francisco, Cal., reports a loss of $290,326 compared with a loss for the year ended June 30, 1927, of $240,228. As in a comparison of 1927 with 1926, most items of expense in 1928 increased over those of the previous year, the total being $3,012,641 against $2,897,905 for 1927. These facts were disclosed in the financial report prepared for and approved by the finance committee of the Board of Supervisors.

STATEMENT OF BUS LINE OPERATIONS OF THE MUNICIPAL RAILWAY OF SAN FRANCISCO

| | 1928 Total |
|---|---|
| Revenues: | |
| Passenger revenue | $109,938 |
| Miscellaneous revenue | 29,424 |
| Total revenues | $139,363 |
| Expenses of operation: | |
| Repairs and painting | $24,857 |
| Tires, including repairs | 16,876 |
| Gasoline and oils | 21,012 |
| Cleaning, washing and servicing | 17,572 |
| Conductors' and chauffeurs' salaries and wages | 67,762 |
| Depreciation of buses | 27,502 |
| Proportion of general expenses— | |
| Insurance | 17,907 |
| Administrative salaries | 8,400 |
| Pension fund payments | 4,200 |
| Equipment rental | 3,294 |
| Garage rental | 3,000 |
| Store room expense | 4,787 |
| Stationery and printing | 300 |
| Total expenses | $217,472 |
| Loss from operations | $78,109 |
| Add: | |
| Interest on investment | 5,794 |
| Loss on buses retired | 12,491 |
| Net loss for period | $96,395 |

An analysis of the item of $8,894,122 in road and equipment shows a net increase over the previous year of $257,282. Provision for depreciation in the amount of $259,105 has been made during the period under review applicable to those assets acquired prior to July 1, 1927. This provision was calculated at the rate of 3 per cent per annum. At stated intervals during the year there were transferred from the Municipal Railway (operating) fund to the depreciation reserve fund amounts aggregating the sum of $250,921 on account of depreciation provision. Construction work in progress totalled $174,654.

Under the heading "Due from General Fund of City and County of San Francisco" is the sum of $82,123, including $32,152 from the account of the Twin Peaks Tunnel and $48,971 on account of Stockton Street Tunnel. Under miscellaneous accounts payable, amounting to $28,902 are amounts of various invoices received from the Market Street Railway representing charges for a portion of the cost of work done on crossings over the Municipal Railway tracks. These charges have accrued over a period of years during which they have been the subject matter of litigation. It appears that legal opinions indicate these to be proper charges.

The reserve for accidents was $80,296 for the year ended June 30, 1928. This reserve fund was established by ordinance No. 7060 N.S. passed by the Board of Supervisors in April, 1926. According to the terms of the ordinance 2½ per cent of the gross traffic revenue

INCOME ACCOUNTS MUNICIPAL RAILWAY OF SAN FRANCISCO

| | Year Ended June 30 1927 | 1928 | Dec. 28, 1912 to June 30, 1928 |
|---|---|---|---|
| Passenger revenue | $3,398,187 | $3,461,859 | $38,939,568 |
| Miscellaneous revenue | 14,145 | 15,806 | 167,438 |
| Total revenue | $3,412,332 | $3,477,665 | $39,107,006 |
| Operating expenses: | | | |
| Way and structures | $144,876 | $155,267 | $1,350,048 |
| Equipment | 212,597 | 238,867 | 2,344,936 |
| Power | 488,143 | 496,421 | 5,308,072 |
| Conducting transportation | 1,843,837 | 1,911,764 | 18,050,926 |
| Traffic | 423 | 291 | 4,551 |
| General and miscellaneous | 190,027 | 210,029 | 1,743,872 |
| Total operating expenses | $2,879,905 | $3,012,641 | $28,802,408 |
| Profit from Operations | $532,426 | $465,024 | $10,304,598 |
| Deduct provision for— | | | |
| Depreciation | 247,362 | 259,105 | 4,176,401 |
| Accidents | 84,954 | 86,546 | 757,531 |
| Total deductions | $332,316 | $345,651 | $4,933,932 |
| Income from operations | 200,109 | 119,372 | 5,370,665 |
| Non-operating income: | | | |
| Income from securities owned | 46,641 | 34,882 | 486,261 |
| Subsidy from harbor commission | 4,470 | 8,374 | 12,845 |
| Other income | 21,734 | 45,191 | 206,266 |
| Total non-operating income | $72,846 | $88,448 | $705,372 |
| Gross income | 272,956 | 207,820 | 6,076,038 |
| Deductions from gross income— | | | |
| Interest on funded debt | $167,768 | $158,358 | $3,064,900 |
| Miscellaneous debits | 22,006 | 4,904 | 64,580 |
| Total deductions from gross income | $189,775 | $163,262 | $3,129,481 |
| Net income before comparative charges | 83,180 | 44,558 | 2,946,556 |
| Deduct comparative charges— | | | |
| Taxes | $318,271 | $328,116 | $3,476,788 |
| Fire insurance | 5,138 | 6,768 | 73,827 |
| Total comparative charges | $323,409 | $334,884 | $3,550,616 |
| Profit and loss balance | *$240,228* | *$290,326* | *$604,059* |

*Italics* indicate loss or deficiency.

CONDENSED COMPARATIVE BALANCE SHEET AS OF JUNE 30

| | 1928 | 1927 |
|---|---|---|
| Assets | | |
| Capital assets | $9,393,650 | $8,969,134 |
| Current assets | 1,482,250 | 2,026,605 |
| Total assets | $10,959,495 | $11,080,168 |
| Liabilities, reserves and surplus: | | |
| Funded debt unmatured | $3,099,000 | $3,295,000 |
| Current liabilities | 400,980 | 574,951 |
| Reserve (total unadjusted credits) | $4,141,226 | $3,951,665 |
| Contributed surplus | 371,733 | 356,552 |
| Net surplus | 3,318,289 | 3,258,550 |
| Total liabilities | $10,959,495 | $11,080,168 |

CASH AND SECURITIES WITH TREASURER

| Funds | Total | Cash | Securities |
|---|---|---|---|
| Accident reserve | $90,322 | *$2,011 | $92,334 |
| Depreciation reserve | 423,343 | 13,706 | 409,637 |
| Depreciation | 337,786 | 59,034 | 278,752 |
| Totals | $851,453 | $70,729 | $780,723 |

* Loss.

ANALYSIS OF ANNUAL PROVISION FOR DEPRECIATION AND PERCENTAGES BASED ON COST, MUNICIPAL RAILWAY OF SAN FRANCISCO

| Fiscal Year Ended June 30 | Provision Gross | For Redemption of Bonded Debt | For Depreciation | Cost of Road and Equipment Amount | Percentage |
|---|---|---|---|---|---|
| 1913 | $24,291 | ..... | $24,291 | $1,660,492 | 1.463 |
| 1914 | 149,672 | ..... | 149,672 | 4,307,115 | 3.475 |
| 1915 | 294,959 | $101,000 | 193,959 | 5,042,331 | 3.847 |
| 1916 | 352,075 | 101,000 | 251,075 | 5,396,706 | 4.652 |
| 1917 | 264,727 | 101,000 | 163,727 | 5,838,791 | 2.804 |
| 1918 | 425,271 | 200,000 | 225,271 | 6,174,607 | 3.648 |
| 1919 | 430,543 | 196,000 | 234,543 | 6,578,885 | 3.565 |
| 1920 | 486,551 | 196,000 | 290,551 | 6,658,817 | 4.363 |
| 1921 | 516,414 | 197,000 | 319,414 | 6,674,682 | 4.785 |
| 1922 | 519,266 | 197,000 | 322,266 | 6,802,637 | 4.737 |
| 1923 | 538,889 | 200,000 | 338,889 | 7,267,837 | 4.663 |
| 1924 | 571,172 | 201,000 | 370,172 | 7,570,225 | 4.890 |
| 1925 | 588,308 | 201,000 | 387,308 | 7,992,410 | 4.846 |
| 1926 | 549,955 | 151,166 | 398,789 | 8,245,407 | 4.836 |
| 1927 | 247,362 | ..... | 247,362 | 8,245,407 | 3.000 |
| 1928 | 259,105 | ..... | 259,105 | 8,636,839 | 3.000 |
| | $6,218,568 | $2,042,166 | $4,176,401 | | |

The difference between the balance in this account and the net provision, as disclosed by the above table, is accounted for as follows:

| | |
|---|---|
| Net provision as disclosed by table | $4,176,401 |
| Less provision applicable to assets retired: | |
| Fiscal year ended June 30— | |
| 1921 | $2,063 |
| 1923 | 30,650 |
| 1924 | 1,082 |
| 1925 | 4,960 |
| 1927 | 43,649 |
| 1928 | 33,066 |
| Total | $115,472 |
| Balance per books, June 30, 1928 | $4,060,929 |

STATISTICAL DATA MUNICIPAL RAILWAY OF SAN FRANCISCO FOR THE FISCAL YEAR ENDED JUNE 30, 1928

| | Total | Per Car-Mile | Per Car-Hour |
|---|---|---|---|
| Passenger revenue | $3,461,859.03 | 0.3584 | 3.4645 |
| Operating expenses | 3,012,641.28 | .3120 | 3.0149 |
| Interest on funded debt | 158,358.34 | .0164 | .1585 |
| Provision for depreciation | 259,105.20 | .0269 | .2593 |
| Provision for accidents | 86,546.56 | .0090 | .0867 |
| Taxes (comparative charge) | 328,116.18 | .0340 | .3284 |
| Fire insurance (comparative charge) | 6,768.67 | .0007 | .0068 |
| Net loss | *290,326.40* | *.0301* | *.5905* |
| *Passenger car mileage | 9,657,311 | | |
| †Passenger car-hours | 999,243 | | |
| Platform expense | 1,588,873.45 | .1645 | 1.5901 |
| Number of passenger cars owned | 234 | | |
| Number of work cars owned | 6 | | |
| Total number of cars owned | 240 | | |
| Total number of buses owned | 18 | | |
| Total number of cars and buses owned | 258 | | |
| ‡Revenue passengers carried | 70,142,704 | 7.2632 | 70.1959 |
| Free transfer passengers carried | 14,575,953 | 1.5093 | 14.5870 |
| Free passengers (employees and police) | 562,514 | .0582 | .5629 |
| Total passengers carried | 85,281,171 | 8.8307 | 85.3458 |

* Includes bus mileage of buses.
† Includes bus-hours of buses.
‡ Transfers lifted at Fillmore and Union Streets treated as revenue passengers pending the result of present litigation with Market Street Railway.
Total single track mileage June 30, 1928 ..... 74.12

must be set aside in the above fund for the purpose of paying claims for accidents and damages resulting from the operation of the Municipal Railway (other than accidents to employees) and expenses incidental thereto.

Ordinance No. 7060 N. S. provides that 3 per cent of the cost of road and equipment shall be set aside each year to meet all charges arising on account of depreciation of road and equipment.

Since the Municipal Railway is owned by the city and county of San Francisco and has no capital stock, the excess of assets over liabilities represents surplus. In the preparation of this report the surplus account has been subdivided into three groups: (1) that which has been contributed; (2) that which has been deducted from operating revenues for comparative charges for which no liability exists; (3) that arising from operation of the railway. A comparative statement of earnings and other data are shown in the accompanying tables.

## Suspension in Ohio Will Affect Many Towns

Residents of more than a score of towns along the line of the Southern Ohio Public Service Company, from Columbus to Zanesville, will be without railway service if that company secures the consent of the Ohio Utilities Commission to abandon its line. Suspension will also mean that the Columbus East Mound Street line, operated by the Columbus Railway, Power & Light Company, will be abandoned. This line has been operated by the latter company through an agreement with the Southern Ohio Public Service Company to furnish the local service required.

The Southern Ohio Public Service Company has been in the hands of a receiver for the past five years. The growing number of autos and buses has greatly reduced its patronage, according to officials, who also point out that the company faces a demand for improvements that would cost nearly $650,000 in Columbus, along the National Highway, and in Newark, Zanesville and at other points.

## Further Simplification of Georgia Power Company Structure

Stockholders of the Georgia Power Company have approved an agreement for consolidation of the Central Georgia Power Company, the Central Georgia Transmission Company, the Macon Railway & Light Company and the Georgia Public Service Corporation with the Georgia Power Company. The consolidation agreement, which previously had been unanimously approved by the boards of directors of the companies, will be submitted to the stockholders of the Macon company at a meeting in Macon shortly. The consolidation, if approved, is expected to become effective in about 30 days after it has received the necessary indorsement of the secretary of state.

## Net Below Allowed Return in St. Louis

The St. Louis Public Service Company, St. Louis, Mo., had a return of only $757,662 on its investment during the quarterly period ended Sept. 30 according to advertisements inserted by the company in the St. Louis newspapers on Oct. 24. The return is $405,999 less than the amount authorized by the Missouri Public Service Commission on the valuation fixed by the state board. It is approximately 4.5 per cent annually, although the commission found that the company was entitled to 7.14 per cent. Under the commission's return basis the net should have been $1,163,661 on its valuation of $63,500,000 during the quarter.

The advertisements are headed "The Facts About Street Fares and Where They Go" and are in keeping with the company's policy of dealing openly with the people on all questions affecting fares and service. Similar statements are to be published at regular intervals so as to keep the public informed on company revenues and expenditures.

Concerning the fares the company's advertisements state:

Various items have appeared recently in the public press referring to the rates of fare. Representatives of the company have not recently proposed any change in fare. They have stated that a 10-cent cash fare, four tokens for 30 cents, for adults, would probably yield approximately the same amount as the present fare.

The company is not now in a position to state whether there will be any change in car fares, because the required revenue cannot be estimated until the Public Service Commission of Missouri has determined the amount of operating revenue required for wages as a result of the hearings just concluded before it.

The company bases its claim to a quarterly return of $1,163,661 on the valuation as of Jan. 1, 1927, fixed by the state commission plus $1,669,974 for addition and betterments since that date.

## Abandonment of Rochester & Sodus Bay Line Approved

The Public Service Commission approved on Oct. 24 a declaration of abandonment by the New York State Railways of the Rochester & Sodus Bay line in the towns of Irondequoit, Penfield, Webster, Williamson, Ontario and Sodus, a distance of about 34 miles. It was found that further operation was not necessary or convenient for the public.

According to the evidence submitted to the commission the number of passengers on the Rochester & Sodus Bay line decreased from 1,708,008 in 1912 to 363,017 in 1927 and 142,179 for the first six months in 1928. Evidence also showed that in 1922 the revenue from passengers was $160,973, while in 1927 it was $92,735. The operating loss for 1927 was $47,486. The company further claimed that if the line were to continue, renewals and replacement to its roadbed and overhead system would require an expenditure of approximately $166,410. Evidence was submitted to show that the earnings of the New York State Railways system were not sufficient to absorb the loss on the Rochester and Sodus Bay line.

## Twin City Issue Approved

The Minneapolis & St. Paul Suburban Railway has been authorized to issue $500,000 in stock, all to be taken by the Twin City Rapid Transit Company, in payment of the act of the Twin City in assuming $500,000 in bonds issued by the suburban company in 1899. After a brief hearing the Minnesota Commission approved the plan on Oct. 25.

## Denver Net Increased

The directors of the Denver Tramway, Denver, Colo., met on Oct. 25, but nothing was done about a change in the fare. The present rate is 8 cents or two tickets for 15 cents if tokens are purchased. The statement of earnings from January to September shows net of $377,511 after deduction of interest. The total operating revenue for the period decreased $67,843 below the similar 1927 period, but net operating income showed an increase of $22,521 accounted for by economies. Total operating revenue was $3,204,651. Return on the investment of the company fixed by the courts is about 4 per cent against a 7½ per cent return deemed to be necessary under court rulings.

# Legal Notes

FEDERAL DISTRICT COURT—*Powers of State Commission Over Fares.*

The Pennsylvania Public Service Act, which empowers a state commission to prescribe fares of street railway companies, does not impair the obligation of contracts even when the original contract with the railway contains a clause limited its fares to a certain amount. [Sambor et al vs. P. R. T. Co., 27F (2d) 406. Also City of Philadelphia ex rel Furey vs. P. R. T. Co. et al. 27F (2d) 439.]

ILLINOIS—*Financial Responsibility for Shift of Track on Viaduct.*

A steam railroad was responsible for keeping in repair a viaduct which was built over its tracks. During extensive repairs to this viaduct, some street railway tracks which were on it had to be transferred from one side of the viaduct to the other and then back again. The expense of this transfer was held to be a part of the general repair of the bridge for which the steam railroad was responsible. [Chicago City Railway vs. Chicago and W.I.R. Co., 162 N.E., 852.]

MASSACHUSETTS—*Railway Not at Fault When Passengers Crowd to Leave or Enter Its Cars.*

A passenger after having left an elevated train was injured on the platform by being jostled by other passengers. The railway was held not at fault in failing to prevent passengers from crowding when they leave or enter its cars in the customary way. Where there is evidence of boisterons or disorderly conduct which should have been foreseen, a jury may find the carrier to have been negligent in failing to prevent it. Testimony that other passengers had been injured at other stations in a similar manner was immaterial, as the only question in the case in point was whether the company had shown negligence to this particular defendant. [Boyd vs. Boston E.R. Co., 162 N.E., 735.]

MISSOURI—*Duties of Guest in Automobile at Railroad Crossing.*

A passenger guest in an automobile about to cross a railroad track is not required to use the same vigilance as is required of the driver, but he is required to use that degree of care that an ordinarily prudent person would use under similar circumstances. In this case the court held that the track, the warning sign, the whistle and the noise of the approaching train were indications that a train would soon be at the crossing, and a word of warning to the driver might have avoided the casualty. Hence. the guest was negligent in not giving this warning. [Cox et al. vs. St. L. and San F. Ry. 9 S.W. (2nd) 96.]

NEW YORK—*Liability of Subway Contractors for Damages to Surface Property.*

A street railway operating over streets under which a subway was being built brought suit against the city for damages caused by interference with its track structure and the operation of its cars. A motion by the defendant to include various subway contractors, because of their responsibility for the conditions complained about was granted on the ground that their contracts with the city covered conditions of this kind. [Eighth & Ninth Avenues R. Co. et al. vs. City of New York et al., 228 N. Y. S., 201.]

OHIO—*Charge on Contributory Negligence Must Be Complete.*

A charge of the court on contributory negligence must be complete, showing both what the duty of the plaintiff is respecting the burden of proof, and what the duty of the defendant is in respect to its burden as to contributory negligence. If the error in such a charge is one of commission, a general exception to it is adequate. If it is one of omission the objecting attorney should suggest what further statement he wants the instructions to include. [Cleveland Ry. vs. McCoy, 162 N.E., 699.]

# Personal Items

JOHN A. REICH, formerly chief engineer of the Ponce Electric Company, Ponce, Porto Rico, has been transferred to the Virginia Electric & Power Company. Eldon Tyler has been selected to succeed Mr. Reich. Both these companies are controlled by Stone & Webster, Inc.

GEORGE E. HAGGAS, for the past ten years chief engineer of the Cumberland County Power & Light Company, Portland, Me., has been appointed assistant general manager of that property. Mr. Haggas was engaged in valuation engineering in Michigan prior to joining the Portland company, and for three years before being made chief engineer was occupied in that branch of technical activity on the Cumberland County system.

OWEN KRAFT has resigned as assistant to the president of the Philadelphia Company, Pittsburgh, Pa., to become associated with the recently opened Pittsburgh office of H. M. Byllesby & Company, investment securities. He commenced his activities in his new field on Oct. 1.

ALBERT M. BOYD has been appointed manager of personnel, claims and safety departments of the Philadelphia Electric Company and the Philadelphia Suburban Counties Gas & Electric Company. Mr. Boyd has been in the employ of the United Gas Improvement Company since June, 1901.

J. L. CAMPBELL is appointed acting chief engineer of the Northwestern Pacific Railroad, San Francisco, Cal. This appointment is effective Oct. 26.

# OBITUARY

## David W. Henderson

**Superintendent of Seattle Municipal dead. Kept road on an even operating keel through storms of public criticism**

DAVID W. HENDERSON, superintendent of the Seattle Municipal Railway from the time of its purchase in April, 1919, by the city of Seattle, Wash., from the Stone & Webster interests, died in Seattle on Oct. 27. He had suffered from pernicious anaemia for many months. Not many weeks ago resort was made to transfusions, scores of volunteers from the railway department offering their blood for their stricken chief. He had revived beyond all expectations, and for some time had been thought on the road to recovery. He had been on leave of absence from his duties with the railway since early in June of the present year.

### BORN IN SCOTLAND

Mr. Henderson was born in Scotland on Feb. 24, 1873. His parents migrated to Randolph, Wis., when he was eight years of age. Educated in the public schools of that state, he began teaching in the country schools at the age of 18 and followed this occupation in Wisconsin until 1902, when he moved to Seattle.

On April 8, 1902, he entered the service of the city railway lines of the Seattle Electric Company as a motorman and continued in that capacity until early in 1905, when he was promoted to the position of inspector. Other advancements followed until at the time the system was taken over by the city Mr. Henderson was holding the position of superintendent of transportation, under G. A. Richardson, general superintendent of the property who is now general manager of the Chicago Surface Lines.



D. W. Henderson

Mr. Henderson was appointed to the position of superintendent of the municipal lines by Ole Hanson, Mayor of Seattle, who had negotiated the purchase of the street railway lines from Stone & Webster, and he continued in this position under subsequent administrations. Distinguished by his rugged honesty, his poise under trying situations and his keen sense of proportion, Mr. Henderson was credited with having kept Seattle's municipal railway on an even operating keel through the storms of public criticism that have assailed it from time to time since its accession from its former owners.

Mr. Henderson is survived by a wife and three sons, the oldest of whom, David Jr., has just completed high school.

## James A. Smith

James A. Smith, superintendent of the Schenectady plant of the General Electric Company for the last fifteen years, died on Oct. 25 at his home in Schenectady. Mr. Smith was endowed with mechanical genius of the highest order and his knowledge of machine tool design and application was unsurpassed. His skill and experience made him a most useful and valuable counselor for any who sought his advice. He possessed unusual executive ability and his acquaintanceship with the employees was of such a kindly and intimate character that he was genuinely loved and admired by them.

His first General Electric position was at the Schenectady plant as assistant to the mechanical superintendent. In a few months' time he was made superintendent of one of the shops. He became general superintendent of the plant in July, 1913.

From 1901 to 1903 Mr. Smith was associated with the Niles-Bement Pond Company, and in 1905 was made superintendent of the Dutchess Tool Works at Fishkill Landing, N. Y., which position he held until he entered the employ of the General Electric Company in 1910.

Mr. Smith was born in Hartford, Conn., on May 25, 1873, and in his youth worked on a farm. In 1888 he entered the employ of Pratt & Whitney in Hartford, Conn., about a year later entering the apprentice shop of that company. He was sent to Chicago to install the Pratt & Whitney exhibit at the World's Fair and, in 1900, was selected to install and demonstrate the company's exhibit at the Paris exposition.

Owen D. Young, chairman of the board of the company, said:

> The death of James A. Smith brings to me and to every one who was associated with him a feeling of great personal loss which is accentuated by the suddenness of the blow. We feel first that we have lost a friend and next that we have lost a competent and highly efficient associate. He was so very human that even his discipline was a delight and, from an organization standpoint, his frankness and directness disciplined those above as well as below, but always with kindliness and charm and, basicly underneath it all, good humor and friendship. How much we shall miss him I need not say, because every person who has come in contact with him knows. I share with his family and with his friends their sorrow at his death.

O. C. Chesney, vice-president and chairman of the manufacturing committee of the General Electric Company, said:

> Mr. Smith was a mechanic by nature and training—a mechanic of the very highest type. His knowledge of machine tools and of their capabilities was unsurpassed by that of any other employee, and it made him for many years a most useful counselor of the manufacturing committee on all questions relating to equipment. He also possessed executive ability of a high order; his activities as an executive being of the direct, human kind.
>
> His premature death is a great loss to the company and a keen personal loss to thousands of individuals.

# Volume of Material Purchases Constant

## Line market active. Hamilton, Ont., orders twelve cars. One car contemplated by Beech Grove Traction

THE apparent decline in the purchase of track materials continues this week. However, according to reports received from a number of electric railways, there has been an offsetting increase in the purchases of line material and equipment. Louisville Railway, Louisville, Ky., has placed orders for 15 miles of 00 round hard-drawn copper trolley wire, 1 mile of 12-gage insulated iron telephone wire, 215 30-ft. class B Western red cedar ½-in. penetration poles, and 75 30-ft. class B creosoted pine poles. Other line equipment ordered by this company includes two electric switch ground boxes, one right-turn signal for use with electric switch and electric circuit changer. 2,500 ½x4½-in. galvanized lag screws, 500 porcelain strain insulators, 500 galvanized guy clamps, 50 bronze frogs, 500 clinch ears, 300 splicing ears, 500 flexible approaches, 50 center castings and 100 end castings for insulated hinges.

Two carloads of bare wire, 1,800 poles, one carload of insulators, overhead frogs and crossovers have been ordered by the Union Traction Company of Indiana, Anderson, Ind. Berlin Street Railway, Berlin, N. H., has placed orders for 25 iron pole brackets and 100 trolley ears. Poles, wire and line material for a double-end siding have been ordered by the Beech Grove Traction Corporation, Indianapolis, Ind. The Brantford Municipal Railway, Brantford, Ont., has ordered 30 trolley ears.

### Track Materials

One hundred tons of 122-lb. girder rail, 120 pairs of 30-in. rail joints and 2,400 1x4¾-in. track bolts have been ordered by the Louisville Railway. The Beech Grove Traction Corporation has ordered 500 ties and special work for a double-end siding. Rail ordered for 1928 by the Union Traction Company of Indiana amounted to 400 gross tons of 70-lb. re-laying type and 100 gross tons A.R.A. 100-lb. rail. Materials ordered by this company include one carload of track bolts, one-quarter carload of tie plates, two cars of spikes, one-half carload of bonds, approximately 50,000 white cedar ties and 25,000 creosoted ties. Brantford Municipal Railway has ordered four kegs of ⅞x4½-in. track bolts.

Five cars of ties for 1929 delivery have been ordered by the Berlin Street Railway. Other equipment ordered by this company includes ten kegs of bolts, ten kegs of track spikes and 1,000 lock washers. The Memphis Street Railway, Memphis, Tenn., is working on an extension of the Jackson Avenue car line from Watkins Street to the L. & N. Railroad. Approximately 1,000 ft. of single track remain to be laid.

### Construction Projects

The first major track job to be done by the Dallas Railway & Terminal Company, Dallas, Tex., under the Everman plan will be that on Cole Avenue at a cost of approximately $125,000. It is doubtful if this rebuilding job can be started until about Jan. 1. In view of the repaving of Commerce Street, city officials are of the opinion that the tracks on this street should be rebuilt and repaved at the same time. This construction will cost approximately $138,500.

The Springfield Street Railway, Springfield, Mass., has completed its major trackwork for this year with the finish of its Benton Lawn job. Worcester Consolidated Street Railway, Worcester, Mass., has just completed the reconstruction of 2,300 ft. of track on Lincoln Street and installed a new switch and mate at a total cost of $12,000. Work has been started by this company on the underground conduit line from Chandler Street between Main and Wellington and the track construction is now under way. International steel ties are being used for the first time in Worcester. A new crossover has been installed near Irving Street, and special curves are to be installed at Posner Square and Penn Avenue. Lynchburg Traction & Light Company is repairing tracks in connection with the repaving of Rivermont Avenue. The city of Miami, Fla., has laid 260 ft. of new track on First Street and has graded 150 ft. for a track installation in the extension of Southwest and Third Avenue.

### Cars and Equipment

Twelve new cars have been ordered by the Hamilton Street Railway, Hamilton, Ont., from the National Steel Car Company. Beech Grove Traction Corporation, Indianapolis, Ind., contemplates the purchase of one double-truck car and trucks for remodeling another car. This company also contemplates electrical equipment necessary for this new car and has ordered one International 15-passenger parlor coach. The Berlin Street Railway has remodeled one car and has ordered door brackets, step brackets, scraper brackets, posts and panels at a cost of approximately $200.

Brantford Municipal Railway has ordered 2 tons of brakeshoes, and two cases of 36-watt lamps. Louisville Railway has ordered 22 treadle door-operating devices and 22 illuminated signs for the remodeling of 22 Birney safety cars. This company has just received nine Studebaker street car type 21-passenger buses and has on order five Studebaker street car type 21-passenger buses and two Studebaker parlor car type 14-passenger buses. It has also received two Mack 29-passenger buses. The Connecticut Company, New Haven, Conn., has ordered seventeen treadle step equipments.

Midland Utilities Company, Chicago, Ill., is planning a power substation and extensions in line and other improvements at Gary, Ind. Berlin Street Railway has ordered one Westinghouse rotary converter at a cost of approximately $3,000. The Connecticut Company has ordered one compression riveter. Preparations are being made by the Indianapolis & Southeastern Railroad, Indianapolis, Ind., to move its general offices in Rushville, Ind., to the remodeled freight office.

## $800,000 Viaduct for Dallas

Construction of levees along the Trinity River between Dallas proper and that part of the city known as Oak Cliff will require the building of a new viaduct by the Northern Texas Traction Company, Fort Worth, Tex., to replace the one which now connects these two parts of the city. The proposed viaduct will cost approximately $800,000. Plans are under consideration by the city commission for joining with the Northern Texas Traction Company in this project so that the viaduct may be for the use of vehicular as well as street car traffic. Although the viaduct will be used by the Dallas Railway & Terminal Company, the cost of its construction will be paid by the Northern Texas Traction Company.

## Interborough May Order More Tokens

The first supply of 7-cent tokens has been delivered to the Interborough Rapid Transit Company, New York, N. Y. Six millions of these tokens, which are made of German silver, have been ordered from at least three companies. It is known that the Johnson Fare Box Company of Chicago has delivered the bigger part of its order for 2,000,000 tokens. The other companies, said to have similar contracts, are the Meyers & Wentz Company, Chicago, and the Scovill Company, Waterbury, Conn.

The Interborough Company expects to increase its order to 16,000,000 tokens if the United States Supreme Court upholds its claim to an increase in fare. The tokens are slightly larger than the nickel.

## Springfield Track Relocation Approved

The Public Utilities Commission has approved the new location of tracks petitioned by the Springfield Street Railway, Springfield, Mass., in connection with the new road on the Chicopee line, and relocation on State Street, Springfield, from the Commercial High School to Saint James Avenue. The track location on Chicopee line will involve laying rails in the center of the new road with double track from the Bosch magneto plant to the Springfield Rendering plant, and single track beyond.

## Buyers and Sellers Adopt Code

That full confidence between both buyer and seller is the greatest need of American business today, was the unity of feeling expressed at a meeting of eminent business executives held recently at the Commodore Hotel, New York City. It was the nucleus of a committee appointed at a conference held last May of representative manufacturers, sales executives, purchasing agents, and business paper editors which had been called by the National Association of Purchasing Agents to consider the subject of "Profitless Prosperity," the responsibilities of the purchasing agent for the lack of profits by many manufacturers, and, if possible, to arrive at a practical and workable solution.

A code, previously prepared by a group of the N.A.P.A. and endorsed by a number of very large organizations to whom it had been submitted, was unanimously adopted. This code or platform of sales and purchasing co-operation is as follows:

Unnecessary sales and purchasing expense is an economic waste, a tax on legitimate industry. Its elimination will assure satisfactory profits to the producer, economy to the consumer, and greater efficiency in commercial relations.

We recognize that the concern which buys must also sell, that buying and selling are companionate functions, that sound commercial transactions must be mutually profitable, and that co-operation between buyer and seller will reduce the cost of purchasing, sales and distribution with consequent benefits to industry as a whole.

In furtherance of these principles, we subscribe to the following standards in our buying and selling.

1. To buy and sell on the basis of *value*, recognizing that value represents that combination of quality, service and price which assures greatest ultimate economy to the user.

2. To respect our obligations and neither expressly nor impliedly to promise a performance which we cannot reasonably expect to fulfill.

3. To avoid misrepresentation and sharp practice in our purchases and sales, recognizing that permanent business relations can be maintained only on a structure of honesty and fair dealing.

4. To be courteous and considerate to those with whom we deal, to be prompt and businesslike in our appointments, and to carry on negotiations with all reasonable expedition so as to avoid trespassing on the rights of others to the time of buyers and salesmen.

5. To avoid statements tending to injure or discredit a legitimate competitor, and to divulge no information acquired in confidence with the intent of giving or receiving an unfair advantage in a competitive business transaction.

6. To strive for simplification and standardization within the bounds of utility and industrial economy, and to further the development of products and methods which will improve industrial efficiency.

7. To recognize that character is the greatest asset in commerce, and to give it major consideration in the selection of customers and sources of supply.

8. To adjust claims and settle disputes on the basis of facts and fairness, to submit the facts to arbitration if a mutual agreement cannot be reached, to abide by the decision of the arbiters, and to resort to legal measures in commercial disputes only when the preceding courses prove ineffective.

9. To provide or accept no gifts or entertainment in the guise of sales expense, where the intent or effect is to unduly prejudice the recipient in favor of the donor as against legitimate competitors.

10. To give or receive no bribes, in the form of money or otherwise, in any commercial transaction, and to expose commercial bribery wherever encountered for the purpose of maintaining the highest standard of ethics in American industry.

## Simplified Practice Gains Supporters

Simplified Practice, or the elimination of waste in industry through simplification, gained 1,705 supporters during the third quarter of 1928, according to Ray M. Hudson, assistant director of the Bureau of Standards, in charge of the commercial standards group.

At the end of the second quarter of this year there were 9,754 individual firms and 883 trade associations supporting simplified practice recommendations. At the end of the third quarter there were 11,319 individuals and 1,023 trade associations.

Commenting on this gain in acceptors, Mr. Hudson said, it was "apparent that the consumers were becoming better acquainted with the benefits that result from buying the simplified or standard lines. The simplified line not only gives purchasers better value in the form of improved quality of product, and cheaper prices, but it makes delivery and replacement a simple problem, since the manufacturers can produce for stock, thus insuring a sufficient supply of the commodity will be on hand with the merchants and jobbers."

## Weekly Business Conditions

Measured by the value of check payments, the volume of business during the week ended Oct. 27 was somewhat smaller than in the previous week, but showed a substantial gain over the same period of last year, according to the weekly statement of the Department of Commerce. Operations in steel plants showed a slight decline in activity from the preceding week but were on a higher plane than at this time a year ago. Prices for iron and steel continued to show further slight recovery, exceeding for the first time this year the level which prevailed a year earlier. Prices for copper were stronger than in either the previous week or the same period of last year.

The value of new building awards during the week showed a higher daily average than in either the previous week or the same period of last year. Bond prices showed no change from the preceding week but were lower than a year ago. Interest rates for both time and call funds averaged higher than in either the preceding week or the same week of 1927. Stock prices reached a new high level during the week.

The output of bituminous coal during the week ended Oct. 20 showed a decline from the previous week but was greater than in the same week of last year. Petroleum output, though showing a fractional decline from the preceding week, was greater than in the same period a year earlier. Freight car loadings for the latest available week were larger than in the corresponding period a year ago.

WEEKLY BUSINESS INDICATORS
(WEEKS ENDED SATURDAY. AVERAGE 1923-25 = 100)

| | 1928 | | | | 1927 | | | |
|---|---|---|---|---|---|---|---|---|
| | Oct. 27 | Oct. 20 | Oct. 13 | Oct. 6 | Oct. 29 | Oct. 22 | Oct. 15 | Oct. 8 |
| Steel operations | 113.2 | 115.8 | 115.8 | 113.2 | 86.0 | 84.0 | 87.0 | 86.0 |
| Bituminous-coal production | ..... | 111.1 | 115.7 | 113.3 | 102.8 | 105.5 | 108.3 | 105.5 |
| Lumber production | ..... | 92.3 | 90.9 | 90.9 | 104.5 | 105.5 | 106.4 | 108.6 |
| Petroleum production (daily av.) | ..... | 120.2 | 120.3 | 121.2 | 118.4 | 119.2 | 119.7 | 121.3 |
| Building contracts, 37 states (daily average) | 144.9 | 135.7 | 134.3 | 180.6 | 131.8 | 152.0 | 115.1 | 117.6 |
| Price iron and steel composite | 86.1 | 85.9 | 85.6 | 85.3 | 85.8 | 85.9 | 85.9 | 87.1 |
| Copper, electrolytic, price | ..... | 110.1 | 108.7 | 108.7 | 94.2 | 93.5 | 94.2 | 93.5 |
| Interest rates, call money | 160.6 | 157.6 | 157.6 | 178.8 | 84.8 | 93.9 | 97.0 | 100.0 |
| Interest rates, time money | 160.0 | 155.3 | 165.7 | 165.7 | 102.9 | 100.0 | 97.1 | 100.0 |
| Federal reserve ratio | 87.7 | 86.8 | 87.2 | 89.5 | 97.2 | 96.9 | 96.8 | 96.6 |

## Manufacturing Activity Highest

Manufacturing plants of the nation closed the third-quarter of the year with operations at the highest rate ever recorded by American manufacturing industry in general. Reports received by *Electrical World* on the monthly consumption of electrical energy by some 3,600 manufacturing plants scattered throughout the nation and in various industries indicate that the operations of these plants during September, after corrections are made for the number of working days, were 11.4 per cent over August, 13.5 per cent over September of last year, and 5.4 per cent above the previous high rate of productivity recorded last February. The average rate of operations in the manufacturing plants.

during the first nine months of the year was 5.3 per cent above that during the same period last year. This is about 2 per cent higher than the generally accepted normal rate of annual growth in American productive activities.

## U. S. Buses Abroad

According to the United States *Commerce Reports,* American buses are scattered all over the civilized world to a great extent. In Aden, the British port of the Arabian Gulf, there are no less than 80 American buses running, which is only five less than are being used in Australia and Tasmania. In the little Azores Islands, 95 American buses are used; 75 are in use in British West Africa; the Canary Islands have 60; and Ceylon 97. Korea has 99 American buses in operation; and China has 92. The Rock of Gibraltar uses 60 American buses; British Guiana, 96; while Guam, and the Philippines each has an even 100. The little British Island of Hong Kong has 78; Iraq uses 50; Mocalla uses an even 100; and so does Tonga; while Palestine uses 93.

Altogether, *Commerce Reports* shows there are 6,084 American buses in use in 119 foreign countries.

## New Screw Thread Report

In the interval which has elapsed since the publication of the National Screw Thread Commission's 1924 report several screw thread standards, which were then in the early stages of development, have been completed. Progress and change in industrial methods also have necessitated some revision of the standards promulgated. The second revision of the report of the commission, which is to be known as the 1928 report, has now been prepared and approved for publication. Those desiring to be notified when the report is available may send their names to the commission, at the Bureau of Standards, Washington, D. C.

## Coal Conference to be Held

More than a hundred speakers representing twelve countries are tentatively listed to present papers at the Second International Conference on Bituminous Coal to be held under the auspices of the Carnegie Institute of Technology in Pittsburgh, Nov. 19 to 24, 1928, according to a preliminary program announced by President Thomas S. Baker. Major subjects to be discussed, it is expected, will include "Pulverized Fuel," "Gas Production," "Liquefaction and Hydrogenation," "Fertilizers," "Origin, Composition and Classification of Coal," "High Temperature Carbonization," "Combustion in Furnaces," "Purification and Cleaning," "Tars and Oils," and "Low Temperature Processes."

The chief purpose of the coming conference will be to present the results of recent studies of coal that have to do with improved methods of utilization and combustion. The list of speakers includes the world's leading authorities on the latest developments in improved utilization of coal as a source of energy and power.

## METAL, COAL AND MATERIAL PRICES F. O. B. REFINERY

| | Oct. 30, 1928 |
|---|---|
| **Metals—New York** | |
| Copper electrolytic, cents per lb. | 15.775 |
| Copper wire, ceots per lb. | 17.875 |
| Lead, cents per lb. | 6.5 |
| Zinc, cents per lb. | 6 60 |
| Tin, Straits, cents per lb. | 49.25 |
| **Bituminous Coal, f.o.b. Mines** | |
| Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons | $4.40 |
| Somerset mine run, f.o.b. mines, net tons | 1.90 |
| Pittsburgh mine run, Pittsburgh, net tons | 1.825 |
| Franklin, Ill., screenings, Chicago, net tons | 1.375 |
| Central, Ill., screenings, Chicago, net tons | 0.675 |
| Kansas screenings, Kansas City, net tons | 1 875 |
| **Materials** | |
| Rubber-covered wire, N. Y., No. 14, per 1,000ft. | $5.3 |
| Weatherproof wire base, N.Y., cents per lb. | 18.625 |
| Cement, Chicago net prices, without bags | 2 50 |
| Linseed oil (5-bbl. lots) N. Y., cents per lb. | 10 5 |
| White lead in oil (100-lb. keg), N. Y., cents per lb. | 13.25 |
| Turpentine (bbl. lots), N. Y., per gal | $0.5925 |

## Detroit May Build Cars

Mayor John. Lodge of Detroit has instructed the Street Railway Commission to proceed at once with the preparations for the manufacture of its own street cars in the municipal shops in Highland Park. According to the president of the commission the department will be prepared to manufacture cars within 90 days, and although it is believed that the first 50 cars will cost in excess of the purchase price, the department will then be in a position to build its cars as cheaply as they can be built any place else. Trailers have been built in the Highland Park shops for several years.

G. Ogden Ellis, president of the commission, cited that the D.S.R. now owns 1,690 cars, 450 of which are now fifteen years old and 125 of which are twenty years old. There are 213 one-man cars.

## TRADE NOTES

Copper-Weld Steel Company, Glassport, Pa., announces that Lowell S. Monroe, former advertising manager for the Electric Controller & Manufacturing Company, is now a member of the Copperweld engineering staff. Mr. Monroe will be engineer in charge of service data.

Roller-Smith Company, New York, announces the appointment of Wise & Braisted, General Motors Building, Detroit, Mich., as its district sales agent in the state of Michigan.

Wagner Electric Corporation, St. Louis, Mo., announces the addition of R. W. Piper to its transformer sales division. Mr. Piper will travel the southeast district, including a section of West Virginia and the state of Virginia, North Carolina, South Carolina, Alabama and Florida. This company also announces the transfer of H. D. Epting from its Philadelphia sales office to the Atlanta sales office.

National Paving Brick Manufacturers Association has moved its offices from Chicago to 1245 National Press Building, Washington, D. C.

E. C. Brown, who has been connected with the Ohio Brass Company, Mansfield, Ohio, for 21 years, is retiring from active duty and moving to California, which has been his plan for some time.

## ADVERTISING LITERATURE

Curtin-Howe Corporation, 11 Park Place, New York, N. Y., has issued a booklet entitled, "A Technical Discussion on Zinc Meta Arsenite." Zinc meta arsenite is the wood preservative developed by the Western Union Telegraph Company. The booklet is made up of three sections. Part 1 is entitled "Chemical Reaction of Wood Destroying Fungi." This was an address before the American Wood Preservers' Association at Montreal last January by Dr. L. P. Curtin, chemist of the Western Union Telegraph Company. Part 2, entitled "Chemistry and Toxicity Data" was prepared by Dr. Curtin as a supplement to part 1. Part 3, "Weathering and Field Tests," is a paper presented before the American Wood Preservers' Association at Montreal last January by Paul J. Howe, construction engineer, Western Union Telegraph Company.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has issued a fourth volume of its book on "Cars and Car Equipment." This issue, known as special publication 1816, includes photographs, floor plans and complete information on equipment, dimensions and service capacity of nineteen modern types of cars purchased during the past year. Copies of this publication may be obtained by writing either to the nearest Westinghouse district office or to the advertising department at East Pittsburgh.

Lincoln Electric Company, Cleveland, Ohio, has recently published a supplement to its 160-page textbook, "Arc Welding—The New Age in Iron and Steel." This 32-page supplement is entitled "How to Begin the Application of Arc Welding in Production Manufacturing." The bulk of the text is devoted to the re-design of machinery. In developing the theory of arc welded design many line drawings have been used which show how standard steel shapes are utilized to build up structures which formerly would be cast. Along with these theoretical designs, are shown photographs of similar designs which are in actual use. The Lincoln Electric Company plans to distribute the supplement without charge to all present owners of the parent textbook. Individual copies of the supplement can be obtained at a small charge from the company.



# "Safe" vs. "Sorry"



If only to insure your peace of mind, you should specify the best emergency equipment that you can buy. To cover the law the hand brake must be efficient, so take a hint from hundreds of the leading electric railway companies and do as they have done—standardize on "Peacock" Staffless. Before the accident, buy the kind of brake you would like to have on your cars when the emergency arises.

Peacock Staffless Brakes more than meet the requirements of emergency equipment. Not only do they require little attention or adjustment themselves, but, because of their design, they function perfectly in spite of slack in the brake rigging. On account of their ability to wind up almost unlimited amounts of chain slack, resulting from wear in shoes and rigging, Peacock Staffless Brakes give more protection than is ordinarily expected.

This is but one of five important features. May we tell you about the others that help also to make the men who specify them safe,—not sorry?

**Peacock**
*Reg. U. S. Pat. Office*
**Staffless Brakes**

## National Brake Company

**890 Ellicott Square** **Buffalo, N. Y.**

*Canadian Representative*
**Lyman Tube & Supply Co., Ltd., Montreal, Can.**
**The Ellcon Co., General Sales Representative, 50 Church St., New York**




*The entire fleet of the Capital District Transportation Company, Albany, N. Y., is equipped with Firestone Gum-Dipped Tires. This photograph shows 20 new buses recently delivered on Gum-Dipped Tires, as specified.*

# for ECONOMY in FLEET MAINTENANCE

Firestone leadership in bus tire design is saving millions of dollars annually for fleet operators. Schedules are being maintained with a new degree of accuracy—road flats are being reduced from 40% to 75%. Individualized tire service, localized to fit the needs of each operator, is preventing costly delays and keeping vehicles on the job every hour of the working day.

Tires are no longer a problem on the more than four hundred bus fleets that have standardized on Firestone Gum-Dipped Tires. Satisfactory performance is not left to chance, but is positively assured in advance by Firestone's program of servicing these tires.

You can obtain the same certainty of good performance, and be sure that your mileage costs each month will be reduced to the minimum — by equipping your fleet with Firestone Gum-Dipped Tires. Ask your local Firestone Dealer about the service he is equipped to give, or write our Home Office, at Akron, Ohio, and we will forward you survey of our service facilities along your routes.

MOST MILES PER DOLLAR

# Firestone

## Gum-Dipped TIRES

AMERICANS SHOULD PRODUCE THEIR OWN RUBBER . . Harvey S. Firestone

# HIDDEN TREASURE

Beneath attractive exteriors of Graham Brothers Motor Coaches are numerous hidden features that account for their clocksure dependability and their long life - - - that make their value exceptional.





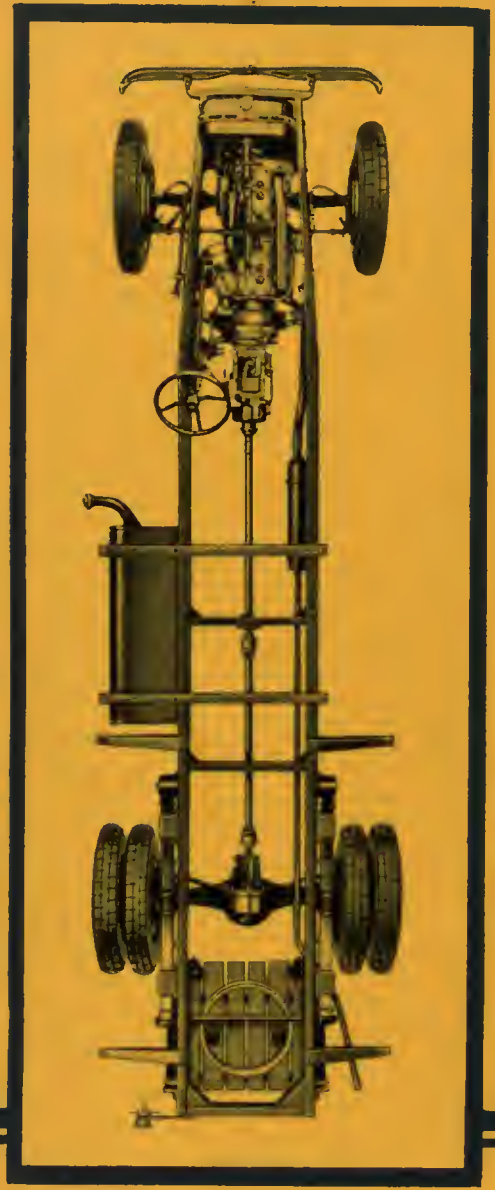
# Unseen Feature
# a Definite

YEAR after year the experiences of owners ac
new weight and new force to the reputatio
Graham Brothers Motor Coaches have made ..
for excellence of performance .... for depend
bility .... for low operating costs .... f
downright, all-around value.

A close study of any one of the types revea
scores of hidden reasons for the continued growt

# GRAHAM
# MOTOR

BUILT BY
MOTOR COACH DIVISION OF
DODGE BROTHERS

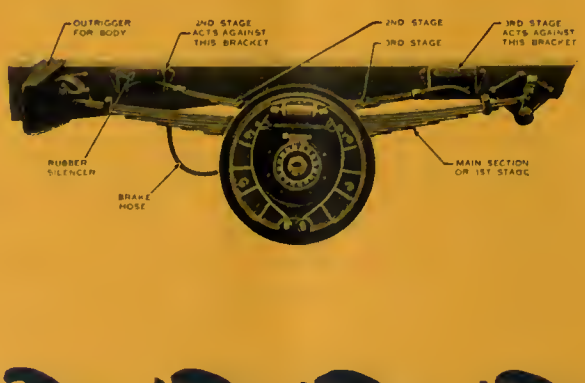


Chassis is clean, sturdy and simple—easily accessible for any adjustment or repair. Note absence of complicated brake linkages, rods and cables.



Radiators on Graham Brothers Motor Coaches and Buses are of the honeycomb type, with shutter controlled from driver's seat. Water-temperature indicator on instument board and thermostat in engine.

The 3-stage progressive rear springs provide surpassing comfort with either light or full load, while the large certain-in-action 4-wheel Lockheed hydraulic brakes insure safety.






Heavy-duty, four-speed tran
sions in coaches and buses pr
that irresistible pull of the lo
for hole or hill, and speed
conditions permit. They with
the constant, gruelling wor
manded by operators of passe
transportation systems.

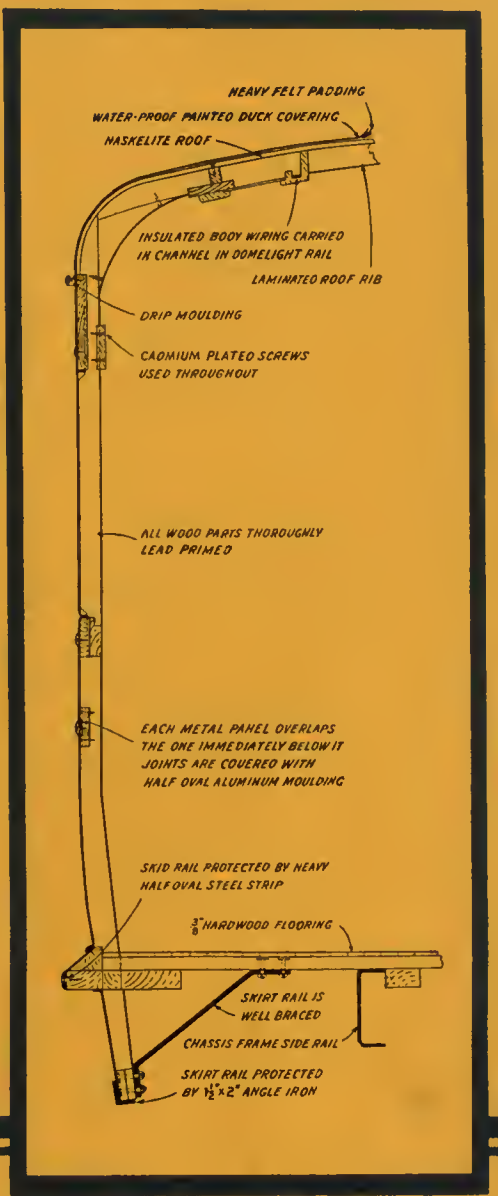
# ive These Coaches
# Plus Value

this fine reputation. A few of these features are own on these pages.

In the improved line are 21-Passenger Street ar Type Coaches, 16-Passenger Parlor Cars, 12-assenger Club Cars and a special Utility Bus. Into e building of each type goes that extreme care d thoroughness that has always characterized odge Brothers manufacture.

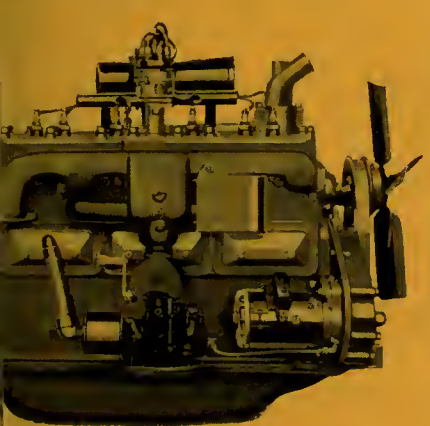
# BROTHERS COACHES

SOLD BY DODGE BROTHERS DEALERS EVERYWHERE




The diagrammatic drawing above shows many of the hidden features that add value to Graham Brothers Motor Coaches.

he 6-cylinder Dodge Brothers en-ne furnishes a smooth flow of power r the heavy demands of coach serv-e. It is designed and built for sim-plicity, power and fuel economy.





The 69-pound seven-bearing crank-shaft is drop-forged, completely ma-chined and heat-treated to obtain hardness, toughness, strength and balance. Inherent balance, massive-ness and a total projected bearing area of 28.36 square inches insure smooth ness at all speeds.



A unique feature of Graham Brothers Motor Coaches is the sturdy guard rail on sides and at rear. This provides added safety for passengers and mate-rial protection to the body through elimination of costly repairs result-ing from minor accidents.

# SERVICE

## Always—and Everywhere

For completeness and accessibility the service facilities for Graham Brothers Motor Coaches are not equalled by any other motor coach organization—either manufacturing or selling. When repair is necessary on a Graham Brothers Motor Coach the mechanic is right there. Any needed spare part is right there. The coach is laid up only long enough for the actual work to be done—no waiting, no delay.

Every Dodge Brothers Dealer is equipped to give immediate service. He knows Graham Brothers Motor Coaches. He always carries a complete stock of repair parts. He is right there where you bought your motor coach this year, next year, whenever you need him.

Each Graham Brothers Coach is the tried and tested product of a great manufacturing institution—famous as a builder of high quality motor vehicles. The skill of thousands of workers, the best of materials, the results of years of experience—all assure you a dependable motor coach that will work with the minimum of interruption year after year and mile after mile.

Then, to further safeguard your investment and your service to your patrons, you have at your call the great nation-wide organization of Dodge Brothers Dealers.

# GRAHAM BROTHERS MOTOR COACHES

SOLD BY DODGE BROTHERS DEALERS EVERYWHERE

# *Put* the battery job up to WILLARDS




Extra strength in every part—accurate workmanship—careful testing of every bit of material—the experience of 25 years of battery building—these are features that fit the Willard for the hard job of bus service.



There are no easy days—no easy miles—in the life of the bus battery. Here's a job that needs weight, reliability, long life—the qualities you get in the Willard Threaded Rubber Battery.

With its heavy plates and long-lived Threaded Rubber Insulation, this battery has built a world-wide reputation for bringing every bus in on time—every trip, and for saving money both by the *month* and by the *mile.*

# Willard Batteries

# FARE TOKENS




SCIENTIFIC construction, manufacturing and research experience, quality metal, large production facilities—these are some of the advantages that are yours in placing an order for Scovill Tokens. For over 100 years Scovill has accumulated valuable experience in the production of fine coins, medals and planchets. Scovill's large volume capacity in the token field is unequaled. The brass and nickel silver is fabricated and the special tools and machinery are built within the Scovill organization. Scovill high quality die work has earned an enviable reputation throughout the electric railway field. Remember that when you buy from Scovill, you have at your disposal all the facilities of a modern efficient organization.

Scovill means **SERVICE** to all who require parts or finished products of metal. Great factories equipped with the last word in laboratories, and modern machinery manned by skilled workmen, are at your disposal. 'Phone the nearest Scovill office.

# SCOVILL

## MANUFACTURING COMPANY---Waterbury, Connecticut

NEW YORK — CHICAGO — BOSTON — SAN FRANCISCO
DETROIT — PHILADELPHIA — LOS ANGELES — ATLANTA
PROVIDENCE — CLEVELAND — CINCINNATI
IN EUROPE — THE HAGUE, HOLLAND

*Member, Copper and Brass Research Association*



Crew erecting single phase 40,000 volt line near summit of Stevens Pass, Cascade Range

Carrying the line down from the summit

Near entrance of present temporary Cascade tunnel

A typical view in the pass during construction

On the Great Northern electrification in its initial stage from Skykomish to Cascade Tunnel, Washington, over 135 miles of Anaconda Wire and Cable Products contribute to the dependable delivery of power. The installation was made by Stone & Webster, Inc.

# ANACONDA WIRE PRODUCTS

**ANACONDA COPPER MINING COMPANY THE AMERICAN BRASS COMPANY**

**General Sales Offices — Rod, Wire & Cable Products — 25 Broadway, New York**

**In Chicago: 111 W. Washington St. Offices and Agencies in principal cities**

58 PLANTS—DAILY CAPACITIES, 20,000 WHEELS

*Are You Using the Great New*

# Single Plate Chilled Tread Wheel?




YEARS of laboratory research and improvement of foundry methods have produced the Great Single Plate Chilled Tread Wheel. It creates a new standard in service qualities and economies. Several years of use have revealed only advantages. The warm reception accorded this wheel bespeaks expanding utility for the Chilled Tread Wheel.

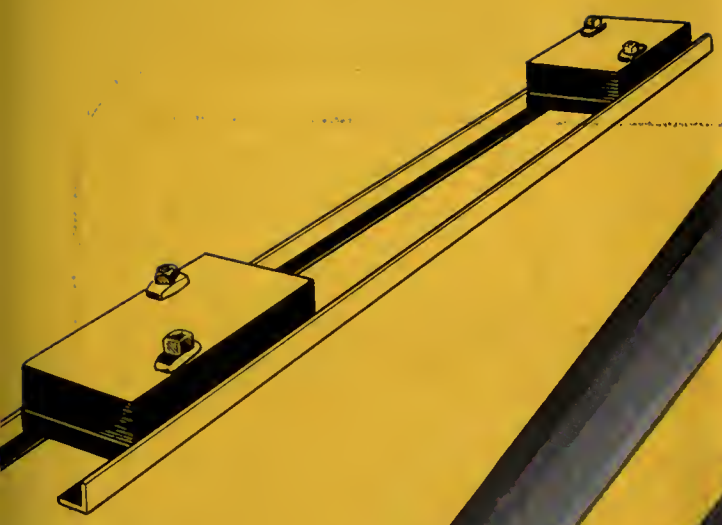
Have you investigated the advantages of the Great Single Plate Chilled Tread Wheel? Are you using it?

**Over 450,000 now in use**
**Better Every Year**

*A. R. A. Standards*

| | |
|---|---|
| 650-lb. Wheel for 30-ton Cars | 750-lb. Wheel for 50-ton Cars |
| 700-lb. Wheel for 40-ton Cars | 850-lb. Wheel for 70-ton Cars |

ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS
1847 McCORMICK BUILDING -:- CHICAGO



# Size

# Size Has No Terrors

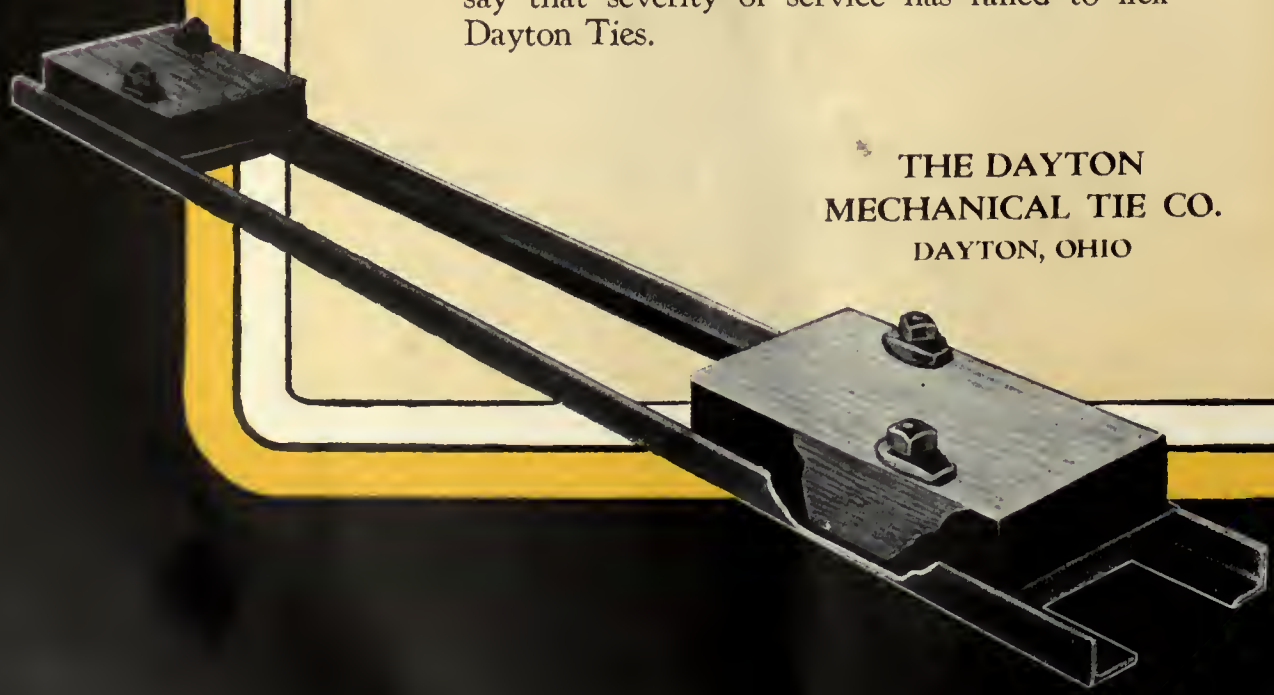
The size of the city has no terrors for Dayton Tie Track. No service is too severe—no headway too great to break down the permanence.

Dayton Tie Track has been in service for years under heavy steam road traffic in crossings with electric lines—has held up—remained in perfect condition.

Trenton, N. J. for example—City lines of Trenton and Mercer County Traction cross the P. R.R. and the P. & R. Railways at several points. On Dayton Ties, these tracks have given splendid service.

The Chicago, South Bend and Northern Indiana R.R. has a stretch of track laid on Dayton Ties. It has successfully carried trains of loaded coal cars for years.

Instances might be multiplied, but suffice it to say that severity of service has failed to lick Dayton Ties.



THE DAYTON
MECHANICAL TIE CO.
DAYTON, OHIO

# *Cheaper to maintain— greater warning powers—no fire hazard*

## THE NEW EVEREADY PORTABLE FLASHER

WHEREVER the kerosene oil lantern now is used as a warning signal, the new Eveready Portable Flasher can be used with large savings. While the first cost of the flasher is considerably more than that of an oil lantern, its maintenance cost is so much less that over a reasonable period of time it saves its cost and then begins to make positive reductions in your expenses.

It is estimated that the average kerosene oil lantern costs $50 per year for up-keep, including filling, cleaning, replacement of chimneys and depreciation.

The Eveready Portable Flasher, on the other hand, is ideally served by Eveready Columbia Dry Cells, one set of which lasts approximately two months on a basis of continuous burning, at a cost of about $10 per year.

Additional savings are realized from the fact that the greater warning power of the intermittent flash enables one flasher to displace several oil lanterns—and give greater protection.

The batteries used are standard six-inch Eveready Columbia Ignitors, universally obtainable for replacements. The intermittent flash uses their capacity to best advantage, making them last much longer than they would under a steady load.





NATIONAL CARBON CO., Inc.
New York, N. Y.
*Branches*
Atlanta Chicago Kansas City
Long Island City San Francisco

UCC
*Unit of Union Carbide and Carbon Corporation*

**EVEREADY**
TRADE MARK
**PORTABLE FLASHER**
***—dry battery operated***

SPECIFICATIONS

Height, 16 inches; diameter of base, 7 inches; weight, including batteries, 16½ lbs. The Eveready Portable Flasher is entirely automatic. Needs no attention other than to replace batteries at intervals of two to three months. Requires four standard Eveready Columbia 6-inch dry cells connected in series to deliver 6 volts. Extra 6-volt lamp inside battery housing. Battery compartment constructed of seamless steel attractively finished in red. Top of flasher cadmium plated for weather protection. Heavy Fresnel type red glass lens. Padlock for battery compartment with an extra long hasp so that the device can be chained. This flasher is of rugged construction throughout and entirely weather-proof.

"CAR CARD ADVERTISING
ALMOST EVERYWHERE"



ELECTRIC railway executives have been solving transportation problems and meeting the needs of the people every day, summer and winter, rain and shine, for many decades. No other group is so eminently qualified to economically render proper mass transportation.

The ability to maintain any service as a real asset can only be proven by a long period of successful operation.

BARRON G. COLLIER
INCORPORATED

NEW · YORK · CITY



# Modern conditions *demand* modern equipment

Traffic conditions today—big cars, heavy loads, accelerated starting and emergency stopping—throw an ever-increasing burden on equipment. Wheels bear the brunt of it all.

Carnegie Wrought Steel Wheels assure high resistance to the wear and tear of modern traffic. Wrought Steel is obtained through forging and rolling. A 10,000 ton hydraulic press (twenty million pounds!) refines the steel—insures a homogeneous structure, free from irregularities that might cause trouble. The rolling process rolls mileage into the steel—mileage to spare. It is this extra mileage that makes Carnegie Wheels such an economical investment.

Before you invest in new wheels, investigate the many advantages of Wrought Steel. A catalogue will be sent at your request. Our wheel engineers are always at your service.

## CARNEGIE STEEL COMPANY

*General Offices—Carnegie Building—434 Fifth Avenue*

PITTSBURGH, PA.

1882-A

# MODERN TRAFFIC PROTECTION
## means closer headway with added safety



"Union" Interlockings at terminal Stations provide for systematic direction of traffic. Car movements are speeded up at terminals as proceed signal tells the motorman that moves may be made with safety over switches properly set.

"Union" Automatic Signals, as in service on many electric railways, are facilitating traffic and the resultant safety secured reacts favorably on the travelling public.

Our specialists at your service—and without obligation.

TRADE MARK **Union Switch & Signal Co.** TRADE MARK
SWISSVALE, PA.

# AMERICAN BRIDGE COMPANY
71 Broadway, New York



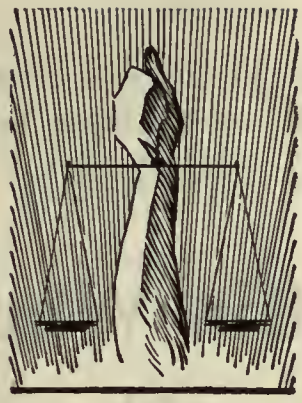
*Highway Bridge across Russian River at Guerneville, Cal.*

*Manufacturers of Steel Structures of all classes, particularly*

## BRIDGES AND BUILDINGS

HIGHWAY BRIDGES
POWER HOUSES BOILER HOUSES
ROOF TRUSSES COLUMNS, GIRDERS

*Offices in Principal Cities*



The only consideration *first* cost should be given in determining upon the selection of *pavements* is to supply a basic figure from which to determine annual costs

Address inquiries to
National Paving Brick Manufacturers Association
National Press Building
Washington, D. C.

VITRIFIED
BRICK PAVEMENTS

*Face the Future—Pave With Brick*




Railroad men all recognize the fact that a tremendous amount of electricity is lost from the rails through the conductivity of the ties when treated with water soluble salts.

The saving in battery expense and general maintenance is difficult to definitely ascertain in dollars and cents, but every Signal Engineer who has had experience with water soluble salts knows that he could save his company a lot of expense, and what is much more to the point, avoid many signal failures.

ZMA gives permanent, positive protection against wood-rotting fungi and white ants. It will not leech or bleed and does not affect the wood strength. Let ZMA lower your maintenance and replacement costs; — communicate today with

**CURTIN-HOWE CORPORATION**
**TIMBER PRESERVATION ENGINEERS**
**11 PARK PLACE**
**NEW YORK CITY**

*Crozer Bldg.*
*Philadelphia, Pa.*

*New Orleans Bank Bldg.*
*New Orleans, La.*

# COLUMBIA

## Railway and Utility Supplies

Castings—Grey Iron, Brass and Aluminum

Forgings
Special Machinery and Patterns

Machine and Sheet Metal Work

Armature and Field Coils.

*The* Columbia Machine Works *and M. I. Co.*
265 Chestnut St., corner Atlantic Ave.,
Brooklyn, New York

# Griffin Wheel Company
410 North Michigan Ave.
Chicago, Ill.

# Griffin Wheels

## with Chilled Rims and Chilled Back of Flanges For Street and Interurban Railways

FOUNDRIES:

| | | |
|---|---|---|
| Chicago | Boston | St. Paul |
| Detroit | Kansas City | Los Angeles |
| Denver | Council Bluffs | Tacoma |
| Cleveland | Salt Lake City | Cincinnati |




## Quality

Back of recognized quality in design and construction of Anderson Time Switches, there are over twenty years of experience.

Skilled workmen make the parts and build the entire Time Switch in our own factory—and quality is proved by performance.

*Send for Bulletin No. 37*

Albert and J. M. Anderson Mfg. Co.
289-305 A St., Boston, Mass.
NEW YORK CHICAGO PHILADELPHIA LONDON

# ELECTRICAL INSULATION

MICANITE and EMPIRE

Micanite and Super-Micanite Sheets, Commutator Segments, and Commutator Rings

Micanite Tubes and Washers

Linotape, Seamless or Sewn Bias
*(Yellow or Black Varnished Tapes)*

Empire Oiled Cloths and Papers
*(Yellow or Black)*

Mico Compounds, Varnishes Etc.

*Send for catalog and helpful booklet on Commutator Insulation and Assembly*

MICA INSULATOR COMPANY
*Largest manufacturers in the world of mica insulation.*
*Established 1888.*

New York: 200 Varick St. Chicago: 542 So. Dearborn St.
Cleveland Pittsburgh Cincinnati
San Francisco Toronto Los Angeles Montreal
*Works: Schenectady, New York.* *London, England*

# That electrical fact you want

*—is here*

For every man in electrical work

This is the one standard electrical help containing all the data, kinks, short-cuts, helps and other information that the practical electrician, wireman, lineman, contractor, plant superintendent and construction engineer needs.

*Croft's*

**American Electricians' Handbook**

By TERRELL CROFT

*823 pages, flexible, pocket size, 900 illustrations, $4.00 net, postpaid*



The book is brimful of those facts which every man engaged in electrical work needs to know.

Think how much help you would be able to get from a convenient pocket-size handbook that gives you in one book—

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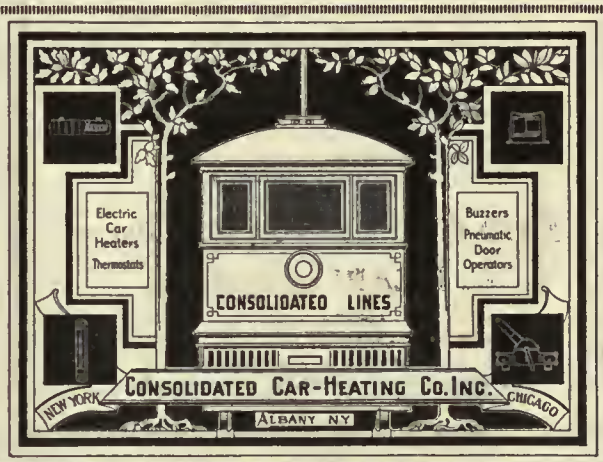
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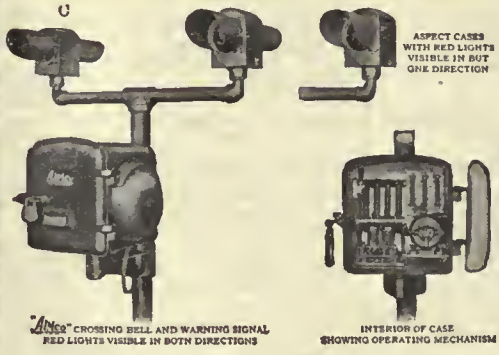
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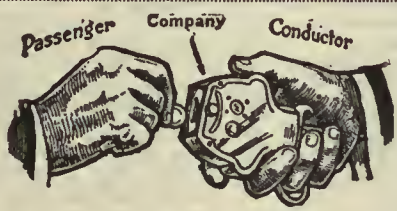
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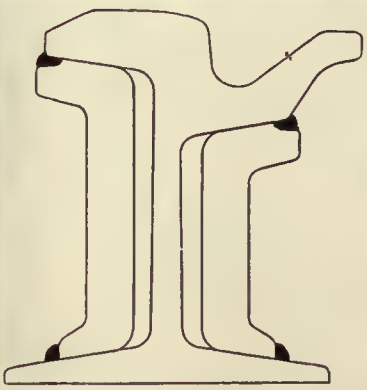
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Lorain Steel Co.
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**Welding Wire and Rods**
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**Wheels, Car, Steel & Steel Tired**
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**Feist Patents**



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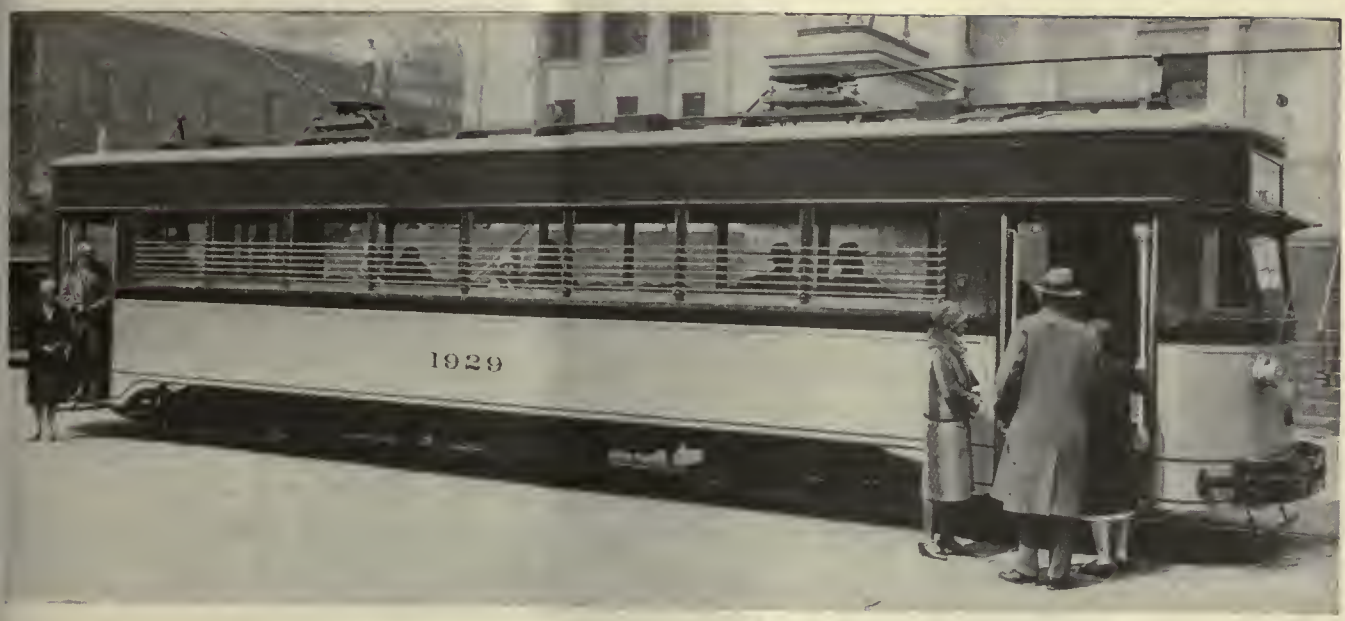
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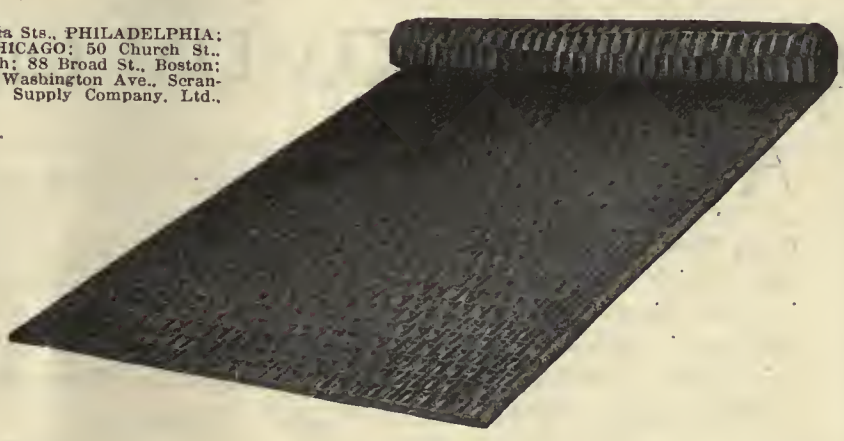
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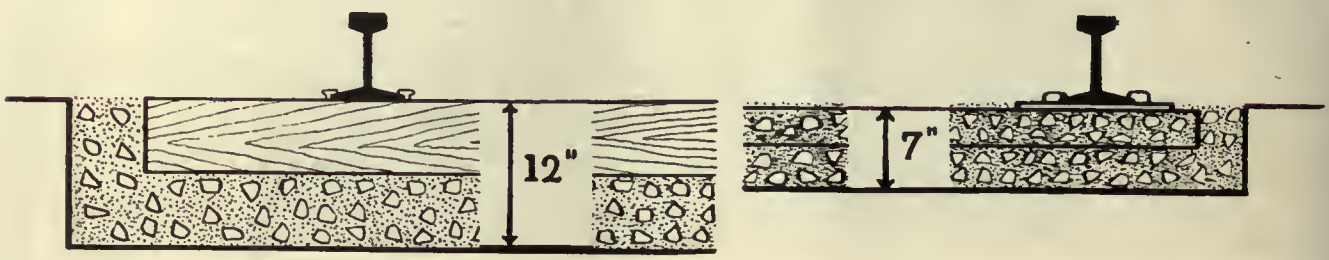
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## and have MAXIMUM Labor Economy

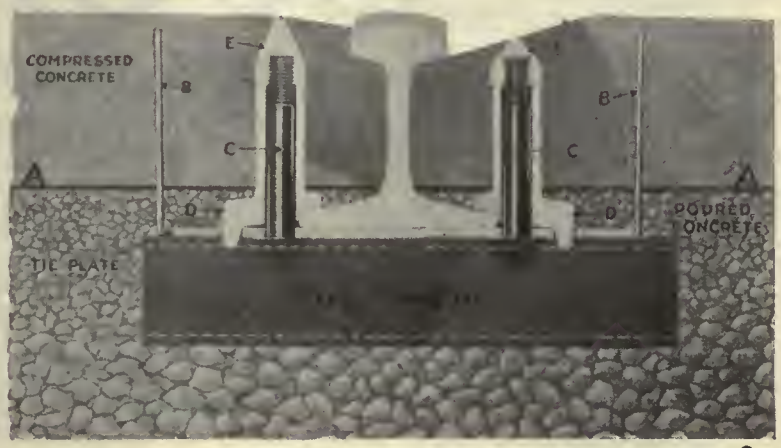
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**Cleveland, Ohio**

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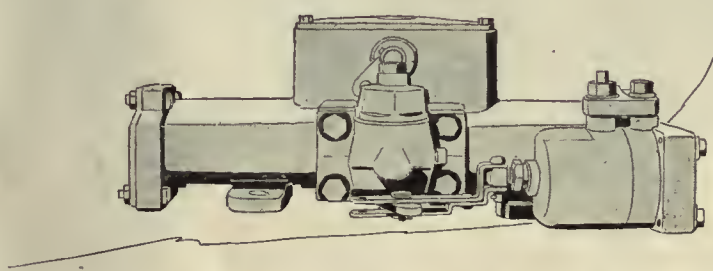
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*One of the ten Timken-equipped Brill cars in operation on railways of Cuba.*



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**TIMKEN** *Tapered Roller* **BEARINGS**



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LIGHT-WEIGHT
-with strength

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-at low cost

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SPEED
-with safety

3


CAPACITY
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4

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## —ONE—TWO—THREE—FOUR POINTS, ALL ARE NECESSARY

And remember, too, that these four points will be as sound tomorrow as they are today.

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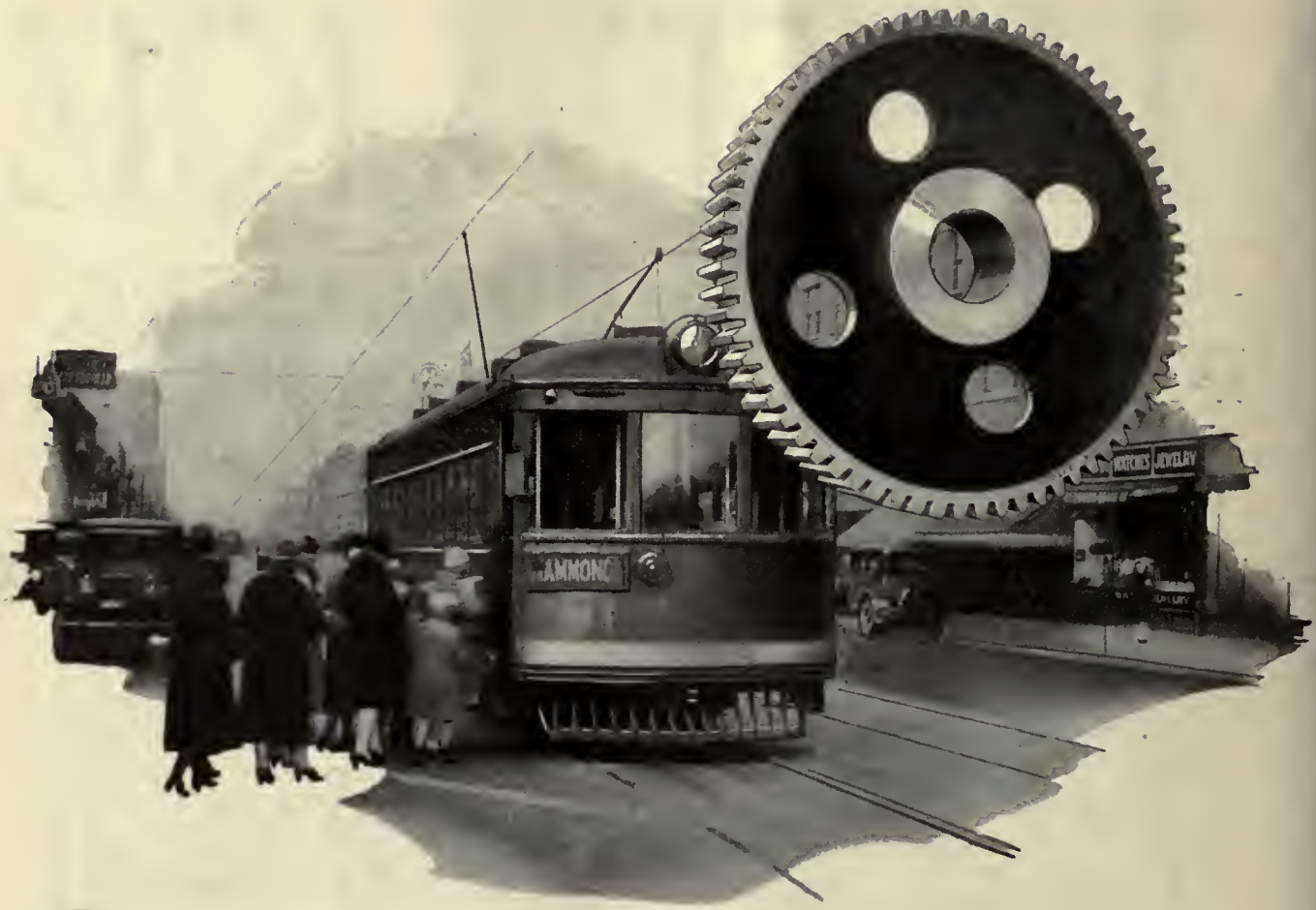
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# Electric Railway Journal

*Consolidation of Street Railway Journal and Electric Railway Review*

*McGraw-Hill Publishing Co., Inc.*
JAMES H. MCGRAW, *President*

CHARLES GORDON, *Editor*

LOUIS F. STOLL, *General Manager*

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## The Nation Shows Good Business Judgment

ONCE again the American public has proved its ability calmly to weigh principles, even in the face of strong appeals to the heart and the emotions. This it has done by overwhelmingly expressing its choice of Herbert Hoover for President of the United States. It admired Governor Smith's qualities of personal magnetism, integrity and courage, but it chose Hoover for President. In that it showed good business judgment.

True, it is probable that tradition, emotion and prejudice played a part in the vote on both sides, but the public had the facts as never before. Never were the issues in a Presidential campaign carried to so wide an audience. For this the radio is largely responsible. It is quite apparent that the new medium of communication permitted the great mass of the American public to judge at first hand between candidates and issues. The result indicates that America's future rests secure upon the ability of its people to sift out of the many phases of a national contest, those issues which are of really vital importance to the country's welfare and continued development.

For the first time since the industrial revolution began to change the character of industry and business, "big business" as such was not an issue. True, one or two big businesses were verbally tarred and feathered for the entertainment of the mob, but it seems quite evident that the voters gave more attention to principles than to fire-works.

In choosing Herbert Hoover as President, the people of the United States have shown that they understand the warning he sounded against the extension of government into business, under whatever guise it may be attempted. They have recognized that social and even moral well-being are founded upon economic health. And they have expressed their determination to continue to build America's future upon the foundation of individual intiative. But they have done more than all of this in that they have chosen to put the affairs of the nation into the hands of an executive who by training, experience and temperament is probably better qualified than any other living man to understand and to deal wisely with the complexities of our delicately adjusted modern economic structure.

## Seen Through Bankers' Eyes

CARDINAL NEWMAN, the English stylist, says that the great author is not one who merely has a *copia verborum* and can turn out at his will any number of splendid phrases and swelling sentences, but he is one who has something to say and knows how to say it. This is the test that the report of the public service securities committee of the Investment Bankers' Association meets. It is a lucid presentation. In the space of about 750 words the committee has reviewed the situation of the electric railways from the dark days of 1920 to the present. This discussion of the status of the local transportation industry by a committee of financiers, is of particular interest and significance.

The statement is made that the industry's survival in the face of the difficulties with which it has been beset is proof of the basic necessity of the service which the railways are rendering. The bankers also recognize that the tension between the railways and the public which they serve has lessened materially and they see in this evidence of an improvement in public understanding of the problems of the railways. The bankers see in recent violent public discussions of the fare problem a factor that is bringing many companies out into the light for public inspection, and they express the opinion that the industry has profited by this. The committee takes cognizance of the speech of Owen D. Young at the recent convention in Cleveland. It calls attention to the fact that the remarks of Mr. Young, an international figure, secured national publicity for the idea that the electric railway is an essential industry, that private ownership is preferable to public ownership, that traffic congestion must not be permitted to fetter public transportation, and that fares must be commensurate with the cost of giving service. The bankers say that not even the most optimistic electric railway men believe the industry is out of the woods yet, or anywhere near it, but they are now certain that the fear of extinction was merely a nightmare; that the bottom has been touched and the way is now upward. All this is doubly significant, since these remarks are made by men against whom no charge of special pleading can be sustained—men not prone to exaggeration of statement.

## Raising the Entrance Requirements

REALIZATION is growing among electric railway executives of the value of specialized employee selection and training. As the results achieved by scientific selection of new employees become available on those properties that are pioneering in this important phase of management, there is every indication that the employment office may be expected to receive increased attention as a laboratory for raising the standards of public transportation service. There is further evidence that the investment which is being made by some properties in personnel and facilities for specialized training of employees is producing an attractive return in the form of men better qualified for their work. If scientific selection is justified, it must reduce the percentage of misfits on car platforms. Similarly, specialized educational and training activities must have as a definite objective the development of a better-informed, more alert and more courteous personnel.

It was with these general thoughts in mind that the training work of the transportation department of the Milwaukee Electric Railway & Light Company, as outlined elsewhere in this issue, was reorganized early in 1926. The training division was made an operating unit of the transportation department with a supervisor re-

sponsible to the educational department for his methods, and to the transportation department for their application. This indicates that the management was well convinced of the value of the instruction work previously carried on in Milwaukee. The present improved and amplified methods of selecting trainmen have shown their worth in the bettered records of new men, as compared with the performance of former recruits. As the caliber of the new employees has been raised, the training division has had increased opportunity for intensive education. No system of training can surmount the barrier established by the intelligence limits of the men available. Therefore, in raising its "entrance requirements" through scientific selection, the company is multiplying the possibilities of its training courses.

That this intensive work of employee selection and training is decreasing the number of chargeable accidents, increasing the equipment-miles operated per pull-in, bettering the record of labor turnover and raising the standards of intelligence and salesmanship displayed by employees, is indicated by the statistics cited in the article this week. The experience of the Milwaukee company parallels that of European electric railways, most of which now conduct extended psycho-technical tests of candidates for employment as trainmen.

## Taxi Mortality Attributable to Lack of Regulation

RECENT price wars among taxicab operators in Louisville, Muskegon, Seattle, Columbus, Cleveland, Providence and other cities emphasize again a fundamental weakness of the taxicab business both from the standpoint of the investor and the public. Inadequate financial return to the operator, and inferior service to the public are the inevitable results of unbridled competition in a business which by its very nature should be considered as a public utility. But in most cities the operation of taxicabs falls far below the level of a responsible and well-organized utility service. True, there are well-managed taxi services in some cities, meeting a real need, but by and large, neither the performance nor the history of the business is auspicious. If the financial manuals are to be relied upon, the records of even the larger companies do not show that their earnings have been commensurate with the opportunity that exists for making a fair profit and building a stable industry.

Many elements tend to give the taxi business a high mortality rate. The most important of these is uncontrolled competition, and the conclusion appears inescapable that the recent rate wars are a reflection of financial desperation on the part of the owners. It is this contingency that stands in the way of organization of the taxicab business on a sounder basis, and prevents its co-ordination with other forms of public transportation service. The benefits that would accrue to the public from such co-ordination, in the form of improved organization, better and more reliable service and responsibility of the operator, are illustrated in Philadelphia and Minneapolis, where the railways have gone into taxicab operation. The advantage of co-ordination from the standpoint of eliminating needless duplication, and consequently reducing traffic congestion is apparent.

In the cities where rate wars have been waged among the taxis, the effect upon the railways has not been serious. If they have done one thing more than another, these rate wars have emphasized the need for regulation. Eventually, this must come, and when it does, the taxicab business itself as well as the public will be the gainer. The question of regulation is of primary importance to no other interest. It is probable, however, that the elimination of cut-throat competition in this field would open the way for more widespread co-ordination of this form of service with other public transportation agencies. It is somewhat surprising that responsible operators and manufacturers of taxicabs have not taken the initiative in sponsoring regulation. If they cannot be brought to subscribe to this need, there is little occasion for shedding tears over the spectacle of the increased mortality among the operators.

## Analyzing the Cause to Prescribe a Cure

ELIMINATION of street traffic delays is only part of the problem confronting electric railways in providing better service. Study of the countless other causes of delay reveals many ways of increasing schedule speeds and effecting other improvements. Often it is desirable to conduct extensive surveys to discover these causes. Some few companies have staffs which continually are making analyses of conditions with the thought of improving the service.

As evidence of what can be done with such surveys, several important railways have steadily increased their schedule speed without any change in equipment. One company employs as traffic engineers technical graduates who have been thoroughly trained for the work by a development course of several years' duration. These men make thorough analyses from time to time of different lines at critical locations in the city. Their reports include recommendations for improvements, and time-tables which will take advantage of these improvements.

On the theory that delays do not merely happen but rather are the result of definite causes, the traffic engineer will find ways of eliminating, wherever possible, the causes of delay. Many other elements can be investigated, some of which are charged to conducting transportation, while others are due to the physical equipment. Such an investigation may well include handling of passengers at concentrated loading points, supervisory attention given the line, attitude of the trainmen and petty difficulties militating against service betterments. In addition, many phases pertaining to traffic movement may be investigated, as the enforcement of regulations directly or indirectly affecting the movement of cars, the need for special traffic or parking regulations and the efficiency of signal lights or officers at important intersections.

Study of the physical equipment of a line may include the checking of switching facilities, adequacy of energy supply, installation of loading zones, wherever possible, lighting of stopping places, and terminal facilities. Different types of equipment may be found best suited for particular lines, and route changes may make the service more effective.

Many discoveries are made by one on the alert. Changing of methods and equipment require more time and greater perspective than the transportation man can give. They are important to the progressive electric railway. To get the best results specially-trained men are needed to conduct surveys at regular intervals.

## "Light Equipment" Move Backed By Our Sister Industry

THE possibilities of securing lighter rolling stock and all the advantages and economies which that means were emphasized at the talk on aluminum and its alloys at the meeting of the Metropolitan Section, A.E.R.A., on Oct. 5. The facts given by the speaker, Dr. Paul W. Faragher of the Aluminum Company, on the extent to which this metal has already been used in steam and electric railway car construction in this country, must have been quite a revelation to many who have not followed recent developments along this line. During the past six years the trunk line railroads have put in operation more than 350 passenger cars in whose construction aluminum alloys are extensively employed for the sake of lightness. Electric roads have built more than 100 cars in which aluminum played a large part.

Significantly, all of the group of 350 cars are in use on lines which are now, or soon will be, electrically equipped. This indicates that the saving in energy required for propulsion was the chief aim sought. Obviously, similar savings would follow the use of lighter equipment in steam service, but it is more evident and more easily measured when electric power is used.

It is also a well-known fact that aluminum alloys have been used in the construction of some of the reciprocating parts on steam locomotives, such as connecting rods, where there are marked advantages in the way of maintenance following the use of light material, in addition to the energy saving. European electric railway and bus companies have also used aluminum alloys extensively in the body construction of their vehicles, though in this case it has been more for side and end sheathing with a wooden frame, than for the framework itself.

That the steam railroads are behind the lighter equipment campaign is highly significant. Operating a heavier class of rolling stock than that used in our industry makes it imperative that the material from which the equipment is constructed should be both highly durable and safe beyond question of a doubt. The field is a fruitful one for study in the direction of reducing car and track maintenance as well as energy costs.

## Science and Knowledge No Respecters of Persons

PROF. H. A. OVERSTREET has written a book "About Ourselves." The obvious thing to say, and the true thing, is that professors are always writing books. But in this instance the professor's work compels interest. He differentiates between two types of individuals, the expansives and the contractives. He says that the mind that is predominantly inquiring is expansive. It does not hold itself fixed in dogma or in absolute value. It presses out to the still unknown, "aiming to extend the area of its intelligent comprehension." That, of course, is a little pedantic. But the professor elucidates by saying that "the inevitably distrustful person is a contractive. He holds off others at arms length, refuses them admittance to his councils, and his confidence. He is widely distrustful—of persons, ideas, movements, motives, of the age in which he lives. He is unable to join in with anything or anybody."

The professor had the individual in mind, but the qualities—or the lack of qualities which he enumerates—are not necessarily limited in their applicaton to individuals. An industry or a part of an industry may be predominantly contractive. That industry or that part of it to which this quality applies surely is on its way to obscurity. By and large, the electric railway industry is an expansive industry. It has widened the field for the use of its products. It is adapting itself to changing conditions. It is striving to improve the living conditions of its workers.

Contractive elements within the industry have been and still are in evidence. But there is every indication that those who have acted at times with an eye only to the present are conspicuous by the difficulty in locating them. In other words, the number of contractives has been on the wane for several years. The advice of a diagnostician is not necessary for the individual to determine in which of the classes he belongs—whether he is a contractive or an expansive. If he cannot decide for himself, there is little hope for him in a world in which science and economics, like time, are no respecter of persons.

## Dogmatic Standardization Decreases Vitality

STANDARDIZATION has been accepted as essential to the reduction of costs and the elimination of waste in industry. The Department of Commerce, through widespread co-operative effort, has brought about considerable progress in standardization and in the simplification of products and practices. From the design of large power apparatus, down to the selection of types and sizes of screw threads, the possibilities of economy through this process play an important part.

But there is another and even more vital force in modern industry. That is research and the development which results from its application. In a measure the forces of research and standardization are opposed. The former tends to overcome the latter and the latter tends to check the former. In a sense research is dynamic; standardization, static. Research overcomes difficulties, improves the product and extends the horizon of an industry. Standardization conserves resources, eliminates waste and reduces costs. Thus there must be constant compromise between these two forces. Otherwise there is danger of waste on the one hand or stagnation on the other.

When standardization becomes an end in itself rather than merely a means to an end there is grave danger to an industry. When it is permitted to stand in the way of adoption and use of needed new developments, then standardization defeats its own purpose. A recent illustration of this condition comes to mind in the electric railway industry. On a particular property almost the entire organization was sold on the merits of a new device. The engineers of the organization had conducted a sufficient number of tests to feel confident that it would reduce their costs. However, because the chief executive of this property had made almost a fetish of standardization, his subordinates dared not recommend the use of this new product, even though they were convinced that the present part should be replaced with a better one.

Research men claim that the relative vitality of industries may be measured by their attention to research and particularly by the time lag required between the conception and application of a new idea. Dogmatic administration of standardization materially increases this time lag, and thus decreases an industry's vitality.

# Specialized Employee Training Pays

## *in Milwaukee*

**Analysis of car and bus operation records for past five years in Milwaukee show results that amply justify the unusual methods of employee selection and training used**



**View of the two-story employee training building and the large plot with the oval practice track for motormen and the macadam road for bus drivers**

WILL specialized training pay? This question was asked by the Milwaukee Electric Railway & Light Company when it reorganized its training division in 1926. So that definite results from a training program could be checked readily and the question answered satisfactorily, the training department was established as a separate division of the transportation department, and a supervisor of training appointed. This supervisor was made responsible to the educational department for methods of training and to the transportation department for their application. Training work was, in this way, accepted as an integral part of the operation of the company.

Studies were made of the jobs for which training methods needed to be devised. The work ahead was outlined, and the following definite objectives were established:

*1. Reduction of Labor Turnover*—Employing and training new men is always a costly matter. While there are many factors which effect labor turnover, it was felt that if the proper men were first selected for the job and then trained to do it well there would be fewer failures and certainly less dissatisfaction.

*2. Reduction in the Consumption of Power*—With a given piece of equipment, power can be saved only by the operator on the car, and he can reduce the energy consumption only if he understands how to handle the car properly. It was felt that if the operator could be made familiar in a practical sense with the conditions existing in his equipment under various phases of operation, he would be able to judge for himself the methods to employ in conserving power. Rules of "don't do this" and "don't do that" were considered to be ineffective.

*3. Improvement of Public Relations*—With only three written complaints from the public per million passengers carried, it seemed that little need be done to improve the public contacts of the trainmen and bus operators. There was, however, a slightly upward trend in the number of these complaints as the extension of one-man cars was in prospect, with evidences of decided opposition from many sources. It was felt that not only must the men who operated these cars be most efficient, but also that their public contacts must be of the best. Accordingly, definite training plans were organized for this purpose.

*4. Reduction of Accidents*—Accidents are always a problem, especially so in the transportation field. In studying this problem, it was felt that a competent and efficient man is synonymous with a safe one. Definite training, therefore, was planned for the prevention of accidents.

*5. Reduction of Delays Due to Uninformed Trainmen*—A study of road delays and interruptions in service indicated a lack of knowledge of the equipment on the part of the trainman operating it. It was hoped that by means of specific training, information could be supplied to all trainmen to correct this condition.

*6. Reduction of Equipment Failures Through Improvement of Operator*—To reduce equipment failures plans were made to perfect a training corps which would follow up every operator on the system periodically to check his method of operation.

Work could not be commenced on all of these objectives immediately, but a start was made on some, and as facilities for more effective training have been added, organization has been perfected to handle all of these.

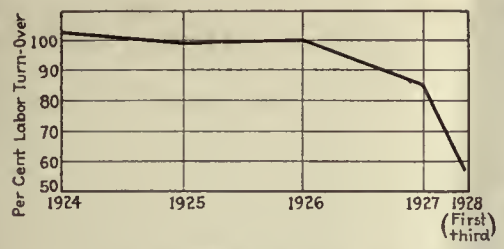



**Fig. 1—Labor turnover in percentage of annual turnover during 1924, 1925 and 1926**

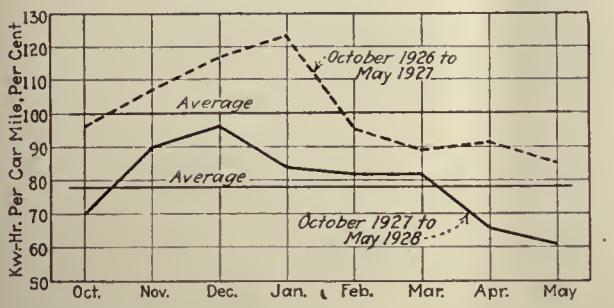



**Fig. 2—Reduction in power consumption per car-mile. Instruction in power circuits commenced in October, 1927; hence the restriction of these curves to October-May periods of the last two years**

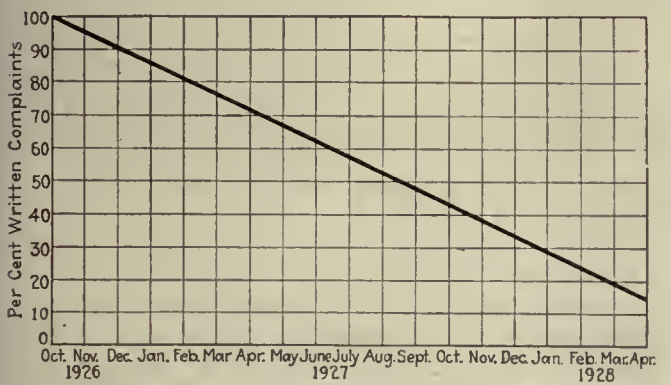



**Fig. 3—Monthly average of written complaints per 1,000,000 passengers**

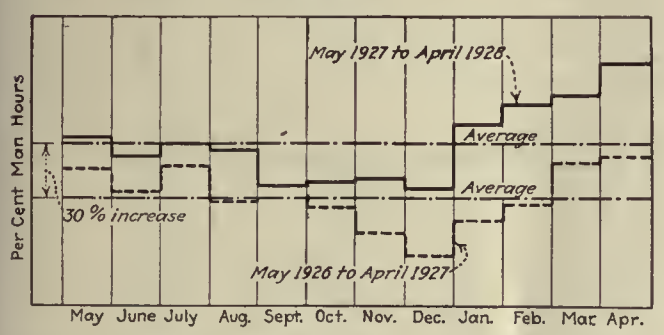



**Fig. 4—Increase in man-hours worked per chargeable accident**

Statistics relating to each of the foregoing objectives are compiled monthly, and the results are discussed with all those responsible for the training work. The accompanying group of graphs depicts the extent of changed conditions since the inception of the training courses. There is no intention of crediting all the improvement shown to the work of the training division of the company; unquestionably, all departments played a part in the general betterment of service, the improvement of employee morale and the reduction of accidents. Careful analysis of the results with respect to the six objectives outlined by the company shows the actual extent of the progress made:

*1. Reduced Labor Turnover*—The labor turnover of 1924, 1925 and 1926 was almost constant. As this was the condition at the time of the reorganization of the training work, it is taken as the base, at 100 per cent, in Fig. 1. The turnover has since been reduced to 58 per cent of what it was at that time.

*2. Reduced Power Consumption*—A course of instruction on the power circuits of the cars was offered in October of last year. This consisted of thirteen one-hour lessons, using equipment described in an article which appeared in the JOURNAL of June 30. Everyone in supervisory positions as well as many trainmen took the course. Systematic follow-up has been an important factor in securing results. The follow-up instructors have been giving particular attention to motormen running too long on resistance points of the controller. The data shown on the graph are for one type of car and are based on an average of 650,000 car-miles per month. The power consumption does not include that consumed by auxiliaries such as heaters and air compressor motors. The average power consumption for the year 1927-1928 has been reduced to about 76 per cent of the average for 1926-1927.

*3. Improved Public Relations*—It was thought that to reduce the number of written complaints on the railway service to a point below three per 1,000,000 passengers carried would be an impossible task. However, the number of complaints are now less than two per 1,000,000 passengers, with the trend definitely downward. Since 1926, about 60 per cent of the men have been trained as one-man operators. In this training public relations had a very prominent place. Training was given in calling streets, making useful announcements, using standard expressions, and in the handling of unusual situations. All other men on the system were given the same instructions through demonstrations by follow-up instructors.

*4. Man-Hours per Chargeable Accident Increased*—There has been a marked increase in the man-hours per chargeable accident, or a marked reduction in the number of accidents per car-mile operated. The continued divergence of the curves indicates that the improvement in this respect may well be expected to continue even in the face of increased operating speeds and a more stringent definition of what constitutes a chargeable accident.

*5. More Car-Miles per Pull-In Charged to Uninformed Motormen*—Schedule delays due to uninformed trainmen have been much reduced. From 1920 to 1926, the car-miles per pull-in remained practically constant. From 1926 to the present, the car-miles for this type of pull-in have been almost tripled. This improvement unquestionably has been made possible by the better facilities for training now available and the improved methods of instruction devised.

*6. Reduced Number of Equipment Failures Due to Improper Operation*—The reduction in the number of delays due to improper operation of the cars has been very marked. Here again, the car-miles per pull-in for this type of trouble remained about the same until 1926. From 1926 to the present, the car-miles per pull-in of this nature have been tripled. The re-instruction of men for one-man operation, coupled with close follow-up of their performance in service, plus a thorough and systematic course of instruction for repairmen, has influenced this trend for the better.

Experiments in scientific selection were conducted from 1921 through 1923. The use of these selection

tests in the routine employment of trainmen was begun in 1925. Proper and thorough training is impossible unless trainable material is available. By furnishing this kind of material, the selection tests have had their influence on the results. Individual analyses also have been made in studying particular trainmen.

It is rather difficult to make a comparison of the selected and unselected railway operators on the basis of discharge records, since in the last year and a half a new policy has been put into effect in the transportation department, which has increased the dismissals for repeated chargeable accidents.

TABLE I—STATUS OF 168 MEN SELECTED DURING 1927

| | Number | Per Cent of Total |
|---|---|---|
| Discharged (not including accidents) | 14 | 8.3 |
| Discharged because of accidents | 9 | 5.4 |
| Resigned | 16 | 9.4 |
| Failed in training or did not complete practice period | 5 | 3. |
| Still in service as motormen or one-man operators | 124 | 73.9 |
| Total | 168 | 100.0 |

TABLE II—RATING BY SELECTION TESTS OF 23 OPERATORS DISCHARGED FOR ACCIDENTS IN 1927

| | Number | Per Cent of Total |
|---|---|---|
| Ranked above average on selection | 8 | 34.8 |
| Ranked below average on selection | 15 | 65.2 |
| Total discharged | 23 | 100.0 |
| Failed on motorman selection test | 6 | |

TABLE III—REASONS FOR REJECTING MOTORMAN APPLICANTS IN 1927

| Reason | Number of Cases | Per Cent of Total |
|---|---|---|
| Motorman selection test | 45 | 46.8 |
| Interview only | 9 | 9.4 |
| Conductor tests | 7 | 7.3 |
| Employment department (references, etc.) | 18 | 18.8 |
| Interview and test | 17 | 17.7 |
| Total rejected | 96 | 100.0 |

TABLE IV—RE-EMPLOYMENT OF TRAINMEN AS MOTORMEN IN 1927

| | Number | Per Cent of Tota |
|---|---|---|
| Re-employed trainmen who are still in service | 30 | 83.4 |
| Re-employed trainmen who left service* | 6 | 16.6 |
| Total re-employed | 36 | 100.0 |

*Three resigned and three were discharged.

TABLE V—MAJOR OCCUPATIONS OF MOTORMEN BEFORE ENTERING SERVICE

(Including those who entered service since 1925 and those transferred to one-man operation)

| Major Work | Total Employed | Number In Service | Per Cent In Service | Number Out of Service | Per Cent Discharged | Per Cent Resigned |
|---|---|---|---|---|---|---|
| Farmers | 161 | 84 | 52.1 | 77 | 8.7 | 32.4 |
| Mechanics | 157 | 102 | 65. | 55 | 8.9 | 24.2 |
| Garage men | 87 | 49 | 56.4 | 38 | 17.2 | 21.8 |
| Laborers | 48 | 35 | 72.9 | 13 | 4.2 | 8.3 |
| Salesmen | 27 | 19 | 70.4 | 8 | 11.1 | 18.5 |
| Clerks | 25 | 21 | 84. | 4 | 0.0 | 16. |
| Miscellaneous | 72 | 40 | 55.6 | 32 | 5.6 | 29.6 |

As shown in Table I the number of new men discharged because of accidents in 1927 amounted to 5.4 per cent. This figure compares favorably with the 2.9 per cent in 1926 and the 0.6 per cent in 1925. Even this figure, which may be charged to the more stringent discipline, is still a little better than one-third of the percentage of unselected trainmen who were discharged for having accidents in 1924 (14.1 per cent).

In 1926 10 per cent of the motormen selected failed in training or otherwise did not complete the practice work. In 1927 only 3 per cent similarly failed, which would seem to indicate increased success in the selection of the men, together with the employment of improved training methods.

Table II gives an analysis of the total number of men discharged with respect to their rating on the motormen selection test.

Table III shows the percentage of rejections for various reasons. Of these rejections, 18.8 per cent were made by the employment department, the remaining 81.2 per cent being made because of failure on the selection tests, the interview, or both.

Likewise, the question of re-employing men who have previously been in the company's service as motormen or conductors was investigated, as shown in Table IV.

A good many of the men desiring to re-enter the railway service had made unsuccessful ventures into businesses of their own; hence it was not surprising to find

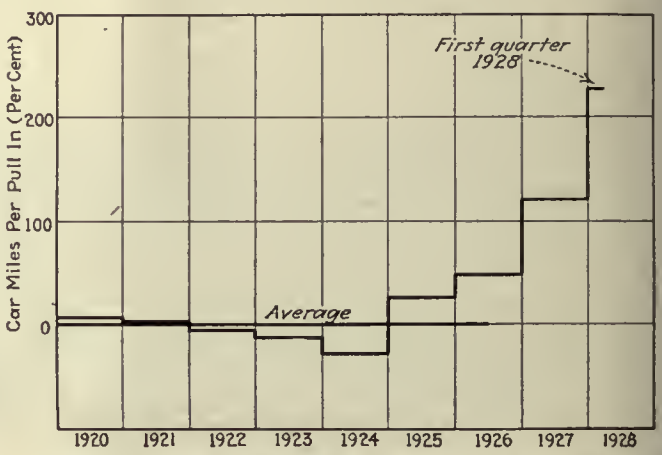



**Fig. 5—Increase in car-miles per pull-in due to any cause**

that when reinstated, these men were more permanent as a group than new men.

No great difficulty has been experienced in preparing regular trainmen for one-man operation. Of 111 men considered for transfer, five were rejected and 106 were given the test. One failed to pass the test and another

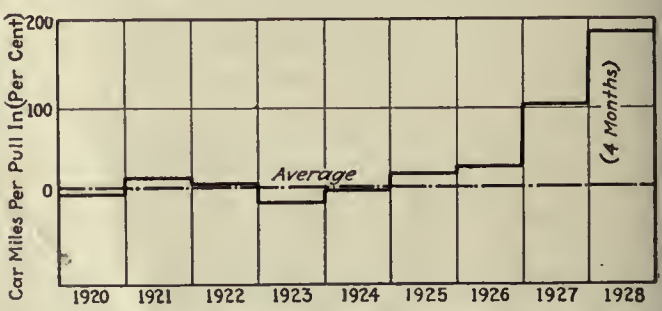



**Fig. 6—Increase in car-miles per pull-in due to controller trouble**

was recommended as a borderline case, so that of the 106, a total of 104 passed.

Another study concerned the major occupations of motormen before entering railway service, including those transferred to one-man operation. The results of the study are given in Table V.

Apparently the largest number of men are those who have had farm, mechanical, or automotive experience; a smaller number are those who have had sales or clerical experience. If the mechanics and automotive men are grouped together, they constitute the source from which 42.2 per cent of all Milwaukee motormen are drawn. This is contrary to the general opinion that the chief source of supply is from the farm. Of those discharged

because of accidents, the farm group is the highest, outside of those classified as miscellaneous, whereas the sales and clerical groups are lower. From the disciplinary point of view, the garage and sales groups show the highest per cent discharged for reasons other than accidents, whereas the clerical is the lowest.

A study was made of car collisions from November, 1926, to June, 1927, inclusive. Fifty-four cases were studied, all being instances where it was definitely known that the car operator had been at fault. Of the 54 men who were observed, 46 had been given the motorman selection test. Sixteen of the tested men had been in service more than a year, and 50 per cent of these had failed on the motorman selection test. Of the 30 tested men in service less than a year, 20 per cent had likewise failed.

All these results show progress toward the accomplishment of every training objective. Were the results to be translated into terms of their monetary value to the company, there is little question but that they would constitute an attractive dividend on the investment in training work and equipment.

## Accident Prevention Contest Is Close

AT THE end of eight months, no "probable winner" of the accident prevention contest of the Chicago Surface Lines could be named. Ten of the twelve participating divisions were staging a "neck-to-neck" race for premier honors, and the two lowest divisions were not far behind.

Points are awarded for the lowest number of fatal accidents to passengers and public, the lowest number of fatal accidents to trainmen and other employees, and for the elimination of all types of mishaps. Percentage values have been fixed for the purposes of the competition as follows:

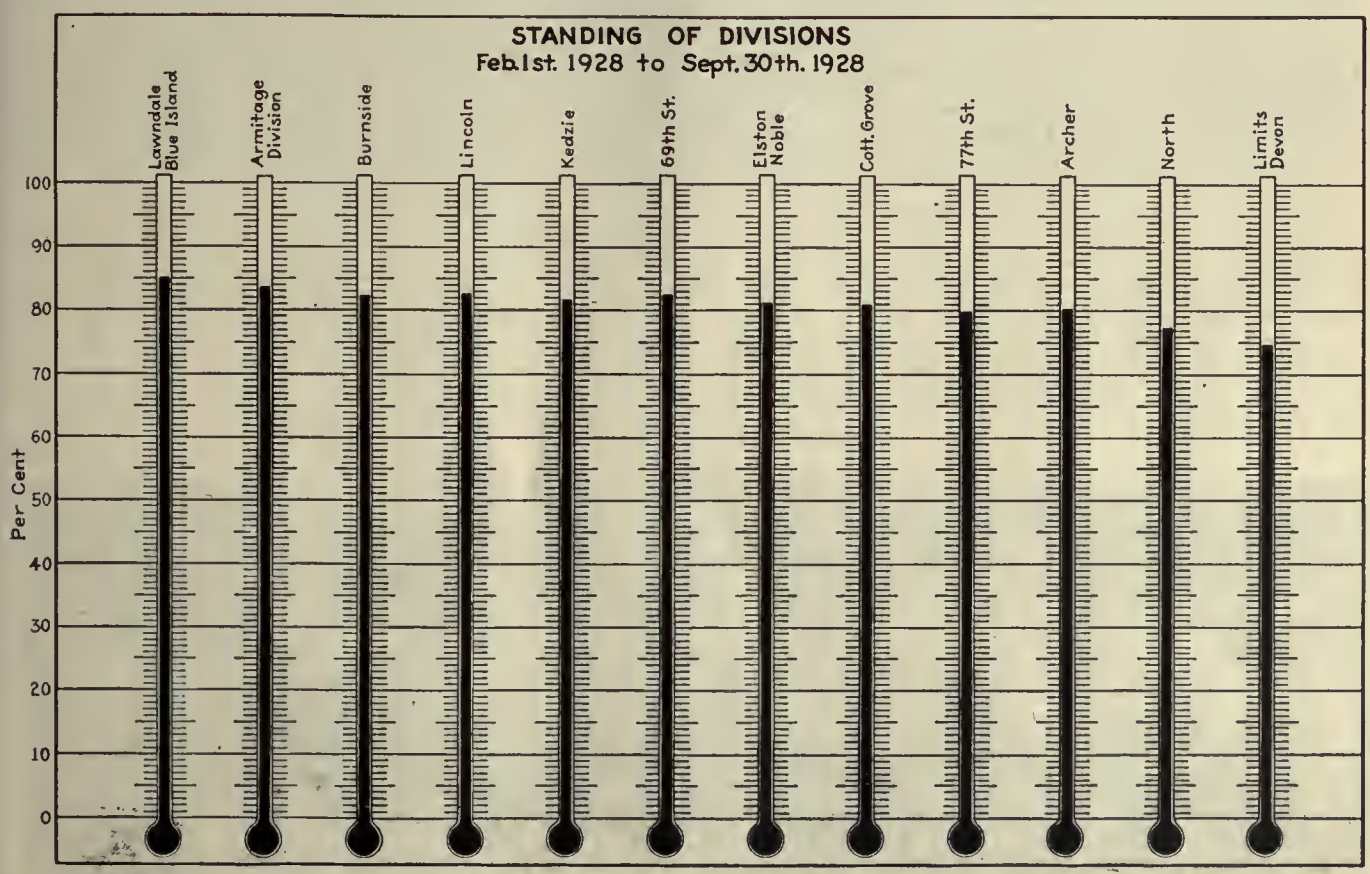
| | | Points |
|---|---|---|
| 1. | Lowest number of fatal accidents and injuries to passengers and public | 10 |
| 2. | Lowest number of fatal accidents and injuries to trainmen or other employees | 5 |
| 3. | Alighting or boarding mishaps | 20 |
| 4. | Collisions with vehicles | 20 |
| 5. | Persons struck by car | 5 |
| 6. | Collisions of cars | 15 |
| 7. | Brushed off step (car in motion) | 5 |
| 8. | Thrown in car by sudden start or stop | 5 |
| 9. | Employee injured under duty | 5 |
| 10. | Blind cases | 10 |
| | Total points | 100 |

## San Antonio Holds Treasure Hunt

THOUGH the San Antonio Public Service Company is a regular patron of the usual methods of advertising its gas, electric and street railway services, it occasionally adds special drives with definite objectives to its program. A most unusual drive to familiarize the public with the routing and general convenience and dependability of its street railway and bus service was carried on during 1927 by the company in conjunction with a local newspaper and a number of merchants. Particulars are given in the company's 1928 Coffin brief.

The drive took the form of a treasure hunt. It appealed to the imagination of all classes, and for many weeks created interest and enthusiasm. The participation of the newspaper brought many columns of first page news items of the progress of the contest, all of which were good publicity for the railway.

During the treasure hunt a full-page display advertisement was used daily, carrying the headline "Follow the




Standing at the end of eight months of the twelve divisions participating in the Chicago Surface Lines accident prevention contest

Trolley to Treasure Land." Part of this page was devoted to detailed diagrams of some particular car line, showing the streets, cross streets and the scheduled time of cars at various points at one-minute intervals. The short time required to travel from the business district to various points in the residential district was emphasized in these diagrams.

Clues and general information were furnished in the daily page advertisements and were supplemented by a generous amount of reading matter. Following the clues, treasure hunters made a journey through the company's office and various street cars and found it necessary to visit the stores of merchants participating in the plan. Some made the hunt in automobiles, some walked, and others found it desirable to ride in street cars, but all were forced to familiarize themselves with the conveniences in the transportation system. As a typical example, one of the rules read as follows:

"Count the number of advertisements in a street car, multiply this by the number of turns made by the Army Post bus on its regular routing, add a certain number, and the total will give you the number of a street car that is now in operation on the North Flores line, carrying the treasure."

It is very interesting to note that in this instance, more than 50 people solved the problem, stopped the proper car, and searched it from roof to truck.

The weekly prize was $50 in cash, together with merchandise orders of equal value. It was necessary to solve each daily problem to locate the weekly prize. In turn it was necessary to solve and keep the solution to each weekly problem in order to compete for the grand prize given by the company, which was $500. In addition to this, merchandise orders amounting to $350 were included in the final prize.

# Motorcycle Emergency Service Proves Effective

By R. C. Rearick
*Chief Traffic Dispatcher Pittsburgh Railways, Pittsburgh, Pa.*

STUDY of the delays to their system convinced the Pittsburgh Railways that the length of delay could, in a great many cases, be lessened materially if a means, more rapid than the regular emergency trucks, was used. Accordingly, on July 1, 1928, the company purchased six Harley-Davidson commercial type motorcycles with side cars to be used for street inspectors. These machines



**Commercial type motorcycles with heavy-duty motors were selected. Note the wire tow cable on the tire carrier**

have a special heavy-duty motor with a maximum speed of 45 m.p.h., and are stationed at strategic points about the system. The regular passenger type of side car was selected instead of the commercial body, so that, if necessary or desirable, the inspector can take someone to help in caring for the emergency.

The side cars are arranged for the carrying of all necessary tools and supplies, such as wrenches, hammers, trolley wheels, fuses, coupler links and pins, tape, trolley rope, etc., for the making of emergency repairs to equipment. They also are equipped with a fire extinguisher, trolley wire pick-up, rubber gloves and first-aid kit. The tire carrier on the rear of the side car is utilized for carrying instead of a spare tire, 25 ft. of $\frac{5}{8}$-in. rope center wire cable with detachable hooks on each end, by means of which derailed cars can be pulled back on the rails or disabled vehicles removed from the track.

The motorcycles are in service eighteen hours per day, two men, working separate shifts, being assigned to each machine. The vehicles, when not in use, are kept in company garages convenient to the places at which they are stationed.

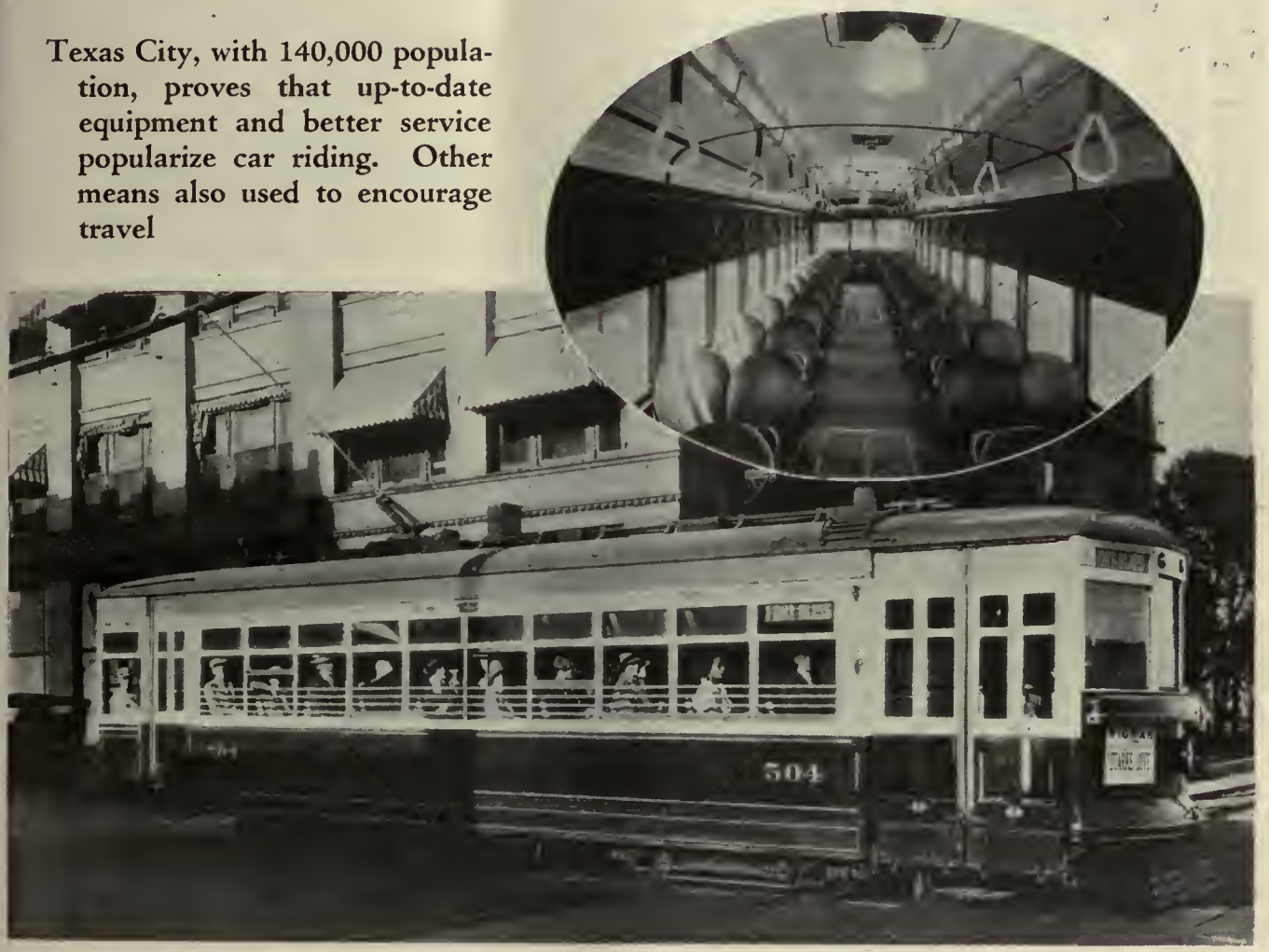
During the three months these machines have been in service, they have proven very satisfactory, providing a light, fast, inexpensive, auxiliary emergency service without the loss of the inspector to the street supervisory force. With these machines, it is possible to quickly dispatch an inspector to any part of the system in contrast to the older method under which the inspector was generally forced to use the street car and often arrived after the emergency had been cleared.



**Six motorcycles with side cars are used in Pittsburgh for emergency service**

# Modern Cars Build Traffic
## *in El Paso*

**Texas City, with 140,000 population, proves that up-to-date equipment and better service popularize car riding. Other means also used to encourage travel**




These attractive cars are helping to increase car riding in El Paso

EL PASO ELECTRIC COMPANY, under the executive management of Stone & Webster, Inc., serves a combined population in El Paso, Tex., and Juarez, Mexico, of approximately 140,000, with a rolling stock equipment consisting of 80 passenger cars, four work cars and eleven buses. Last year the company added seven new street cars and rebuilt seven of its older cars and installed modern equipment. The higher acceleration and improved loading and unloading facilities of these cars have permitted an increase in the speed on the lines where they are being operated from 10.3 to 11.9 m.p.h. This has made possible the handling of as many passengers on a line with five cars as formerly were hauled with seven cars. The length of time the cars have been in operation has been so short that figures are not available as to the exact extent to which they have developed additional traffic, but it is obvious that the public is using them to a greater extent than formerly. The accompanying data relating to these cars are taken from the company's brief for the 1928 Coffin prize.

The new cars are of the double-truck, single-end, one-man, Birney safety type, with automatic treadle-operated rear-exit doors and double front-end doors for entrance and exit. Low floors with ramps to the doors speed up the loading and unloading of passengers. The doors and steps are of the folding type and of positive action. The door edges of the posts are equipped with folded strips of extra flexible leather in place of the customary rubber.

The new cars were equipped with individual type seats, spring cushions and upholstered in genuine brown leather. Each car can accommodate a seated load of 49 passengers. The floors are covered with rubber tiling, which makes an unusually neat and attractive appearance and presents a surface that is easily cleaned. It also deadens the noise in the car from the trucks. The window posts are narrow, and metal sash is employed to give the riders unhampered vision.

The interior of the cars is finished in mahogany with all metal fixtures nickel plated and all pipes in the front vestibule neatly boxed. The fare box is driven by an air motor and is nickel plated. The cars are equipped with sanitary hand straps.

The lighting units are shaded by glass bowls, mounted as an integral unit with the ventilators. They extend the






**These views show the original condition of the rebuilt cars**

length of the car in the center of the ceiling, which is of Haskelite finished in white enamel.

The exterior appearance of the car is enhanced by a hinged skirt, suspended from the sides of the car body, so that the noise of operation is deflected. A row of lights shielded by a cowl extending across the top of the front and rear dashboards greatly adds to the appearance of the cars at night.

The painting is carried out with a streamline effect, the colors extending in an unbroken line through the doors and around the ends of the car. The body is done in Cordovan red, the window posts and panels in white, and the panels just below the roof in blue. These color shades have been carefully blended and harmonized. As the cars operate on a line to the largest cavalry post on the Mexican border, the coloring is very much in keeping with the service rendered. The new cars were built by the American Car Company of St. Louis.

### Novel Method of Introducing New Cars

The company adopted a novel method of introducing the new cars to the public. Following their arrival, all inspectors spent a full day at the carhouse familiarizing themselves with all operating details. Then two cars were taken out on the line. One, in charge of a regular operator and an inspector, was stationed on a siding across from the main office of the company, and suitable signs invited the public to make a thorough inspection. The second car was run on one of the principal lines in the downtown section, a short belt line, and the public was invited to take free rides. Both the car on the siding and that operated on the belt line were on display from 9 a.m. to 9 p.m. for three days. The plan was given wide publicity in the local newspapers, both in news columns and by regular use of advertising space.

Approximately 13,000 people took advantage of the opportunity to visit the car on the siding and ride on the one operated on the belt line during the three-day period. The result was that the new equipment became the talk of the town.

Besides adding these new cars, the company rebuilt seven of its older cars during 1927, as explained. Those selected were of the double-truck, double-end, four-motor type. Automatic treadle-operated rear-exit doors were installed with double front doors for entrance and exit. These doors are of the folding type with wireglass in the lower panels and clear plate in the upper panels. The doors were entirely new, and the door engines were placed overhead in the vestibule, inclosed in attractive cabinets.

The controller box was turned with its back to the side wall of the vestibule, so that the treadle door valve and the selector valve could be cared for without crowding. Another advantage of the change was that it placed the controller handle in a more natural position for use by the operator. The fare-box post, which formerly extended from the floor to the ceiling, was cut off even with the sill of the front vestibule window and moved forward. This allowed more room in the vestibule and removed an obstruction to the operator's vision. A dividing rail was placed in the vestibule between the entrance and exit doors, and another rail separates the passage to the treadle door. Hand brake wheels were discarded in favor of drop brake handles, which were considered to take up less space and to be more sightly.





The way the cars looked after modernization

Each car roof was completely recovered with canvas and a new Haskelite ceiling was installed. The hand straps used and the lighting system are the same as in the new cars. The wooden slat seats, including the backs, in the old cars were upholstered with curled hair and covered with brown Spanish grain leather. The old flooring was replaced with new wooden floors overlaid with Celotex and covered by battleship linoleum. The steps from the vestibule into the car and the folding steps were equipped with Kass safety treads. The red, white and blue color scheme used in the new cars was followed in the rebuilt cars. The cost of remodeling these cars was approximately $2,500 each, exclusive of overhauling and replacement of old materials.

### Better Service Slips

While these cars proved efficacious traffic builders, they have not been the only means followed for encouraging car riding. All employees are supplied pads of 50 slips, known as "Better Service Slips." Every time that a significant remark is heard about the company or about ways in which it could improve its service the employee records it on one of these slips. The slips are then sent to the manager and by him to the customers' service department. These slips help in three ways. Some good suggestions are received; they offer an index of the company's standing in the community, and they stimulate employees to render the best service of which they are capable.

Regular complaints received by mail are handled by the customers' service department, and in almost every case the reply is made by a personal call. This method has been found to be productive of the best results. If the matter will require some time to investigate, the complaint is acknowledged by mail with the explanation that the company appreciates the interest prompting it and that a report will be made later. Where the complaint is received by mail from a person well known to some official of the company, the reply sometimes takes the form of a telephone conversation instead of a call.

A unique practice was begun in 1925 and has since been continued of trainmen handing greeting cards to all customers on Christmas Day. Last Christmas a total of 20,000 such cards were distributed in this way. The public reaction was distinctly favorable. This practice was helped by the fact that every car carries the name of the operator in a conspicuous place on the fare box. Hence the operators are individually known to many patrons.

The company arranges to have various magazines treating public utility questions sent to the public library, Chamber of Commerce and elsewhere where they will be read, so that utility problems can better be understood.

### An Information Booth

In San Jacinto Plaza, in the heart of the downtown district, an information booth has been erected for the benefit of those who want to be informed about the company's railway and bus service. Maps showing the routing of all cars and buses, as well as the block numbers on various streets, are distributed free. The attendants in charge also are prepared to supply information on steam railroad schedules, sport events, amusements, fire alarm calls, and other information of general public interest.

The buses, both in city and interurban service carry unique courtesy signs lettered across the rear end: "Toot Your Horn and This Bus Will Gladly Move Over."

When the company decided some time ago to paint its cars a different color the choice of color was taken up with the City Planning Commission. This act received the unqualified indorsement of the commission, which made suggestions as to the color schemes.

### Campaign Against the "Pick-Up" Evil

El Paso is one of the best paved cities in Texas and contains a private automobile for every seven inhabitants. At one time it was customary for many automobile owners, on their trip to town or return, to invite friends and even strangers to ride with them in their cars. The result was a loss of patronage by the railway. The latter published advertisements discouraging the practice, but it continued. Finally, the company decided upon a personal campaign.

Now, when a car operator notices that a private auto-

mobile owner is habitually picking up his passengers, he takes the license number of the car and turns it over to the superintendent. The automobile owner is then interviewed by some company official, supervisor or operator who knows him. The general line of argument in all such cases is that a local business man has no more right to take away prospective railway passengers than a company would have deliberately to set out to injure the business of a local merchant. The point is also made that this practice makes it much more difficult for the company to maintain its service and pay dividends to its stockholders and wages to its employees, and that a good street railway service is an asset to every city.




**This booth is maintained in downtown El Paso for the dissemination of information on car and bus schedules and other data desired by the public**

The company had very little difficulty in making those to whom this argument was presented see its logic. In practically all cases promises were secured from them to refrain in the future from offering free rides to prospective railway patrons, waiting on the streets for a car.

# Holyoke Street Railway Develops New Headlight

IMPRESSED with the necessity for the frequent need for dimmers with the more powerful headlights now in use, G. E. Pellissier, assistant general manager Holyoke Street Railway, Holyoke, Mass., has developed a lamp which, while illuminating the track and highway ahead, also floodlights the outlines of the front end of the car to which it is attached and does not have to be dimmed under any circumstances. Mr. Pellissier found in his experience that in a number of instances where accidents occurred after nightfall complaints were made that the glare of the headlights was responsible, and that even where dimmers were used the sudden transition from very bright light to comparative dimness was confusing alike to motorman and automobile drivers.

The new headlight has a non-glaring pick-up of from 300 to 500 ft., and illuminates not only the space out ahead of the car but the front of the car itself and from 25 to 30 ft. each side of it. With the front end of an approaching car floodlighted in this maner there is little chance for an autoist or pedestrian to confuse it with any other kind of vehicle. The headlight is simple in design, involves no expensive apparatus and requires no dimming arrangement of any kind. Experiments are now being made with lamp bulbs which, if satisfactory, will eliminate the headlight resistances.

While the new headlight is not in production as yet, it is in the hands of the Crouse-Hinds Company and the Ohio Brass Company for further development.

Besides installing the new headlights the Holyoke Street Railway is equipping all of its cars with Person's 5-in. amber reflectors, for use as markers. It has been found that these reflectors indicate very clearly the outline of the car when the newly-designed headlight is used and that where the power is off the reflectors are equally effective in catching the reflections from the headlights of approaching automobiles.



**At left—Looking directly into the new headlight from a distance of 75 ft., showing illumination of front dash. At right—View taken from the side of the car at night, showing pick-up of new headlight**

# Transportation in Japanese Cities

*By S. Kanaya*
Chief, Section of General Affairs Electric Bureau of Tokyo,
Tokyo, Japan



The Tokyo railroad station, served by both buses and street cars

JUST as in the cities in America or Europe, a horse car line appeared as the first means of mass transportation in the communities of Japan. This line, however, was destined to be superseded within a comparatively short time by an electric surface car line.

The first regular electric road was built and operated by a private company in Kyoto in 1896, and within the next ten years the principal cities, such as Tokyo, Osaka, Nagoya, Kobé, and Yokohama, had successively installed their own systems. With the exception of the Osaka Railway, which always has been under municipal control, all these systems were built and operated by private companies. It was not until 1911 that these private electric roads began to be purchased by the municipalities concerned.

Owing to the increase in traffic from year to year, it was apparent that some kind of subsidiary service would have to be provided in some of the larger cities, in conjunction with the street railways. Tokyo was first driven to this need and the Tokyo Motorbus Company was incorporated in 1917, and began its regular service on the main streets of the capital city.

The disastrous earthquake and great fire of 1923 had destroyed the street railway system of Tokyo. To meet the deficiency of transportation caused by the calamity, the city of Tokyo installed a motorbus service in 1924, which, having been improved and extended, is still in use.

Recently bus service under private or municipal control was inaugurated in most of the larger cities, such as Osaka, Kobé, Nagoya, and Yokohama. However, the extension of this service in these cities, except Osaka, is still limited and conservative.

The cities of Tokyo and Osaka have been authorized to construct municipal rapid transit systems and are now engaged in the preliminary construction work. There is also the Tokyo Underground Railway, which acquired a franchise for an independent line about 10 miles long. A part of this line has been constructed and was opened to the public in December, 1927.

## Transit Conditions in Tokyo

In 1882 the first horse car line was established by a private company in Tokyo. Before that time, there had not existed any means of public conveyance. Consequently, the success of this undertaking was great despite the poor condition of service.

In 1891 the National Industrial Exhibition was held in Tokyo, where the first experimental electric car was operated with success, and in 1904 the last horse car lines then existing were electrified. Two other street railways were installed a few years later and eventually were amalgamated with the original tramway, thus forming the Tokyo Tramway Company.

In 1911 the city purchased from the Tokyo Tramway Company all the existing lines of electric surface cars in the city and began operation under management of the Electric Bureau. At that time there was about 119.5 miles of track operated, with 1,514 cars owned; the average number of daily passengers carried amounting to about 534,400, with a revenue of 18,500 yen a day.

After having purchased the company's lines the Bureau extended several of them and constructed new lines, thus improving the equipment and service. There are now 197 miles of track operated with 1,598 cars owned. The average number of daily passengers carried is 1,200,000, with a passenger-revenue of 80,000 yen a day.

The total passengers in 1924 amounted to about 490,000,000, being the largest number of passengers ever carried by the electric tramways of the city. A marked decline in passenger traffic began to manifest itself in the subsequent years, which was due principally to the





**At left—The Matsuya department store in the shopping district of Tokyo. At right—Buses and street cars run on this street in the business district of Tokyo. The First Mutual Life Insurance Building is shown in the background**

rapid development of the suburban districts. Probably more than 500,000 persons then residing in the city area moved out into the suburbs, thus decreasing the patronage of street cars, the service being generally limited within the city proper. The total passengers carried by each type of conveyances in Greater Tokyo are as indicated by an accompanying table.

There are two independent bus systems in Tokyo City; the municipal service, with 60 route-miles and owning 379 buses; and the Tokyo Motorbus Company, with 25 route-miles and 284 buses.

There is also an electric railway line of the Imperial Government Railway, which runs around the city limits and partly through the downtown district on the elevated structures and is practically a rapid transit railway. This comprises 59.7 route-miles, with 300 motor cars and 403 trailers. In 1927 the total passengers carried by this railway line amounted to about 290,000,000.

As was said in a preceding paragraph, a part of the Tokyo Underground Railways line (about 1.5 miles) was opened to the public at the end of 1927. The average number of passengers carried daily is about 25,000.

The municipal rapid transit railway comprises four authorized routes of about 42 miles, and will cost approximately 187,000,000 yen. The preliminary work for construction is now being carried on by the Electric Bureau of Tokyo City. It is probable that a part of this municipal rapid transit railway will be constructed in the near future.

### Traffic Situation in Other Cities

Considering population within the city limits only, Osaka is larger than Tokyo. However, from the point of view of transit, Osaka is inferior to Tokyo.



**Modern cars serve the business section of Tokyo around the Yusen and Marunouchi Building**

As indicated by the accompanying table, the number of passengers carried by the Osaka municipal electric tramway has shown only a slight increase in the last few years. This was due to the rapid development of buses and taxis in the city. There are at present two motor bus systems. One is the municipal motor bus service, which operates about 80 buses. The other is a private company, with 270 buses owned. There are also about 2,500 taxis in service.

In other cities, namely, Kyoto, Nagoya, Kobé and Yokohama the urban transportation is still under complete control of electric tramways operated by the municipalities. The transit conditions in these cities are as indicated by the tables on page 841. Tokyo is omitted from these tables because the principal data are given on this page.

TRAFFIC FIGURES IN GREATER TOKYO

| Year Ending March 31 | Population, 1,000 | Rides per Inhabitant | Number of Passengers Carried, Millions — Total | *Tramways | Electric Railway Line, I.G.R. | ‡Motor Bus | †Suburban Electric Railway |
|---|---|---|---|---|---|---|---|
| 1919 | 3,206 | 157 | 504 | 395 | 59 | 6 | 44 |
| 1920 | 3,309 | 163 | 540 | 401 | 79 | 8 | 52 |
| 1921 | 3,451 | 182 | 624 | 448 | 107 | 9 | 60 |
| 1922 | 3,558 | 195 | 695 | 479 | 128 | 12 | 76 |
| 1923 | 3,052 | 216 | 660 | 385 | 164 | 16 | 95 |
| 1924 | 3,480 | 243 | 844 | 482 | 188 | 34 | 140 |
| 1925 | 3,580 | 242 | 865 | 461 | 208 | 41 | 155 |
| 1926 | 3,708 | 240 | 888 | 435 | 243 | 42 | 168 |
| 1927 | 3,837 | 244 | 935 | 433 | 275 | 47 | 180 |

*Excluding passengers carried by a special line of Tokyo Municipal Tramway which serves the suburban district.
‡Passengers carried by the municipal and private motor buses.
†Including passengers carried by the Tokyo Municipal Tramway Suburban line.

While Kyoto operated approximately the same number of route-miles in 1927 as in 1919, the number of car-miles operated has increased during that period from less than 7,000,000 to almost 10,000,000. Passenger traffic has almost doubled in the nine-year period and the revenue in 1927 showed an increase of more than $3,000,000 since 1919.

Nagoya, Kobé and Yokohama have extended their route mileage from year to year, Kobé having almost trebled the 1919 mileage. Passenger traffic and revenue have also substantially increased from year to year, as shown by the accompanying tables.

With the rapid development of motor buses in Tokyo and Osaka, the control by the electric tramways of the urban transportation in these cities seems to be coming to an end. But it is incredible that the electric tramways in these cities will be superseded eventually by buses. On the contrary, it is quite certain that the time will

OPERATING RESULTS OF JAPANESE MUNICIPAL TRAMWAYS

These tables are all for the year ending March 31. The fare in each case is 6 sen (3 cents), with privilege of free transfer, except in Kobé, where the fare is 5 sen (2½ cents), with privilege of free transfer.

OSAKA

| Year | Route-Miles Operated | Car-Miles Operated | Passengers Carried | Passenger Revenue, Y. |
|---|---|---|---|---|
| 1919 | 38.24 | 17,878,989 | 216,539,684 | 6,962,047 |
| 1920 | 39.25 | 20,942,358 | 262,162,367 | 8,443,798 |
| 1921 | 41.91 | 22,679,219 | 254,375,500 | 12,441,350 |
| 1922 | 45.47 | 24,887,246 | 267,092,806 | 15,224,280 |
| 1923 | 60.62 | 28,116,375 | 285,632,624 | 16,245,499 |
| 1924 | 51.81 | 30,257,108 | 301,255,979 | 17,118,043 |
| 1925 | 53.46 | 32,102,272 | 300,293,266 | 17,043,773 |
| 1926 | 54.21 | 33,385,879 | 304,643,900 | 17,270,448 |
| 1927 | 55.19 | 34,324,294 | 309,136,891 | 17,530,240 |

KYOTO

| Year | Route-Miles Operated | Car-Miles Operated | Passengers Carried | Passenger Revenue, Y. |
|---|---|---|---|---|
| 1919 | 29.50 | 6,694,260 | 55,673,234 | 2,140,018 |
| 1920 | 29.50 | 6,843,921 | 69,856,963 | 2,710,541 |
| 1921 | 29.50 | 7,677,180 | 72,538,684 | 3,886,470 |
| 1922 | 29.50 | 7,824,871 | 77,814,948 | 4,600,033 |
| 1923 | 29.50 | 8,626,764 | 84,148,160 | 4,893,767 |
| 1924 | 30.60 | 9,004,262 | 88,957,436 | 5,156,091 |
| 1925 | 30.50 | 9,390,994 | 92,295,912 | 5,340,438 |
| 1926 | 30.50 | 9,780,053 | 93,162,747 | 5,388,439 |
| 1927 | 28.74 | 9,858,380 | 97,082,375 | 5,597,795 |

NAGOYA

| Year | R ute-Miles Operated | Car-Miles Operated | Passengers Carried | Passenger Revenue, Y. |
|---|---|---|---|---|
| 1919 | 23.50 | 4,960,589 | 39,893,941 | 1,345,994 |
| 1920 | 25.69 | 5,402,105 | 52,228,569 | 1,733,634 |
| 1921 | 25.69 | 5,420,369 | 58,501,336 | 2,091,888 |
| 1927 | 25.69 | 5,965,724 | 70,860,057 | 2,555,801 |
| 1923 | 28.09 | 4,377,838 | 52,643,078 | 2,038,972 |
| 1924 | 29.52 | 7,180,611 | 85,944,341 | 3,303,282 |
| 1925 | 30.17 | 8,543,872 | 91,539,902 | 3,511,965 |
| 1926 | 30.18 | 8,620,702 | 94,828,207 | 3,638,789 |
| 1927 | 31.14 | 8,897,885 | 99,090,368 | 3,814,560 |

KOBÉ

| Year | R ute-Miles Operated | Car-Miles Operated | Passengers Carried | Passenger, Revenue, Y. |
|---|---|---|---|---|
| 1919 | 7.62 | 2,441,207 | 51,284,411 | 1,499,330 |
| 1920 | 8.04 | 2,705,593 | 52,386,816 | 1,872,107 |
| 1921 | 8.06 | 3,445,671 | 57,314,414 | 2,805,173 |
| 1922 | 11.00 | 4,805,772 | 64,108,981 | 3,140,305 |
| 1923 | 12.26 | 6,127,385 | 73,791,111 | 3,635,411 |
| 1924 | 13.34 | 6,684,130 | 80,679,672 | 3,973,738 |
| 1925 | 15.28 | 7,480,824 | 87,376,615 | 4,301,364 |
| 1926 | 17.00 | 9,130,047 | 91,243,582 | 4,490,350 |
| 1927 | 18.19 | 11,316,400 | 101,681,548 | 5,005,578 |

YOKOHAMA

| Year | Route-Miles Operated | Car-Miles Operated | Passengers Carried | Passenger Revenue, Y. |
|---|---|---|---|---|
| 1919 | 11.90 | 3,255,295 | 30,065,105 | 1,123,799 |
| 1920 | 11.90 | 3,277,923 | 37,848,132 | 1,433,330 |
| 1921 | 11.90 | 3,678,095 | 47,565,086 | 1,811,302 |
| 1922 | 11.90 | 4,363,295 | 41,545,601 | 2,423,136 |
| 1923 | 11.90 | 5,006,174 | 47,873,018 | 2,779,246 |
| 1924 | 11.90 | 3,669,119 | 40,623,428 | 2,333,756 |
| 1925 | 13.00 | 4,805,786 | 48,903,884 | 2,830,682 |
| 1926 | 15.40 | 4,959,639 | 47,553,374 | 2,735,741 |
| 1927 | 16.72 | 4,879,931 | 48,033,691 | 2,759,620 |

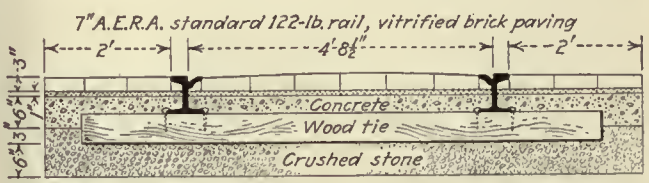
never come when the electric tramways will be deprived of the important rôle which they are now playing on the stage of urban transportation.

Needless to say, the provision of a municipal rapid transit railway in Tokyo and Osaka, having a population of more than 200,000, is a pressing affair. The municipalities concerned realize this condition and are now planning to build a municipal rapid transit system at the earliest date possible.

# Extensive Track Renewal Program in Richmond

PROCEEDING through the heaviest part of a major track renewal program on some of the most congested traffic streets in the capital city of Virginia, the Virginia Electric & Power Company, Richmond, Va., holds the enviable record of never having delayed a single car or having a single accident. Although compelled to wait on a delayed city street program, the track crews have already completed three major jobs.

At present work is being rushed on a 24-hour basis on Seventh Street, from Canal to Marshall Streets. This




**Standard type of track construction for paved streets, being used in the extensive program of the Virginia Electric & Power Company**

project involves 3,000 ft. of double track on a maximum grade of 5.5 per cent, with the construction crossing five main arteries of traffic. Standard 122-lb., 7-in. girder rail is being used on 7-in. x 8-in. x 8-ft. white oak ties. These are being laid on 6 in. of 1-in. crushed granite. The ties are covered and partially surrounded with a 6-in. layer of concrete. The job is completed with 3-in., vertical fiber, wire-cut brick paving on a 1-in. plain sand cushion.

Another feature of this work, which got under way Aug. 20, and which is set for completion about Nov. 20, is the use of approximately $6,000 worth of new pneumatic machinery. To insure adequate working conditions for a 24-hour day, the entire job is brilliantly lighted. The next major job to be undertaken is that of reconstructing 4,000 ft. of double track on Main Street from Fifth to Laurel Streets. The same type of construction will be used with the exception that Cary-Elastic rail filler will be used to reduce noise, as this portion of Main Street is semi-residential.

The total expenditure on these jobs will be approximately $140,000. There have been no serious car delays on this project, and according to F. C. Womack, engineer of maintenance-of-way, this record has been maintained during the past five years.




**Track construction in progress in Richmond. Note the sign at the right, reminding the public that a million fares are being spent to improve the service**

## Railway Electrical Engineers Convene

COMMITTEE reports and ensuing discussion at the Nineteenth Annual Convention of the Association of Railway Electrical Engineers, held at Chicago from Oct. 23 to 26, revealed a steadily increasing number of applications of electrical energy to steam railroad requirements. Of the nine reports presented at the convention five were especially conspicuous for the scope and importance of their contents, among them being reports on train lighting, power plants, motors and control, illumination, and locomotive electrical equipment.

The report of the committee on train lighting received much discussion, particularly the section devoted to electric refrigeration for dining cars. Other subjects touched upon in this report included the lighting of parked Pullman cars, fabric faced pulleys, locomotive lighting and the standardization of illumination for rail motor cars. The committee on power included in its report the subjects of combustion and furnace design, stokers, piping, prime movers, purchased power and power contracts. With regard to purchased power and power contracts the committee furnished information concerning methods of keeping cost records and recommended a special form for power records. The subject of motors and control was divided into three parts, each being handled by a sub-committee. One covered the application of motors to various types of machines; another prepared instructions for the maintenance and test of motors, and the third presented specifications for the purchase of electric motors and a form to be used in ordering motors.

The work of the committee on locomotive electrical equipment was prepared by two sub-committees, one furnishing a tentative specification for locomotive wire, and the other treating the subject of cost accounting related to inspection and maintenance of automatic train control equipment. The committee on illumination devoted its report to the development of lamps for train and locomotive service, lamps for special purposes and floodlighting for railroads. The lamp demand tables were brought up to date. The remaining four reports, those on the manual of recommended practices, radio application, electric heating and welding, and self-propelled vehicles, while much shorter than the others, were productive of valuable discussion.

An interesting and important part of the convention was the display of electrical equipment by 67 member companies of the Railway Electrical Supply Manufacturers' Association. The registration of engineers who attended the convention and exhibit exceeded the 360 mark for the four days.

## American Standards Association Now a Reality

UNANIMOUS approval by the 37 member bodies now provides for the establishment of the American Standards Association to succeed the American Engineering Standards Committee. It is felt that a more widespread participation by trade associations towards national industrial standardization will result from the abandonment of the committee form of organization previously used.

One of the first acts of the new association will be the organization of a board of directors composed of twelve industrial executives. This newly created board will control the general administration and policies of the association. The old committee made up of representatives of all the member bodies now becomes the standards counsel and in its hands will rest matters connected with the adoption and approval of national standards.

The officers of the association are: W. J. Serrill, president; Cloyd Chapman, vice-president; P. G. Agnew, secretary; F. J. Schlink, assistant secretary.

## Spring Switches Used on South Shore Line

HIGH-SPEED spring switches of the No. 20 type were installed for the new siding of the Chicago, South Shore & South Bend Railroad at Tamarack, Ind., recently opened to traffic. Many railway engineers have contended that spring switches were not suitable for high-speed operation, but the South Shore engineers have worked on the theory that the switch points can be protected satisfactorily by automatic signals.

In 1926 the South Shore engineers installed turnouts of the spring type at some of the least traveled portions of the line. No. 16 switches were used. Operation of these switches has been satisfactory. The signals are set to show red if there is as much as $\frac{1}{8}$-in. opening in the switch point. When the new Tamarack siding was tested out experimental trains were run through the switches at a speed of 60 m.p.h. Tests of the signal protection at the points also showed that the slightest separation of the points caused an immediate danger signal to show on the target. At present the motormen are limited to 45 m.p.h. through turnouts.

## Electric Railway Joins France and Spain

DIRECT railroad connections between France and Spain across the Pyrenees Mountains, which separate these two countries, has been an active subject of discussion for many years. Now one line has been completed and two others are under way. Up to this time rail transportation between the two countries was limited to lines along the coast, either on the Mediterranean or the Atlantic Ocean side. The new line considerably reduces the distance and running time between many important cities in France and Spain.

The longest tunnel on the route is 7,822 m., or about 4.9 miles in length. It is at an altitude of 4,000 ft. above the sea, and about 2,500 ft. below the peak of the highest mountain above it. One end of the tunnel is in France and the other in Spain.

Railway operation on the French side to the International Railway station on the south side of the tunnel is conducted by the Midi Railway, which already has equipped a number of sections of its line with electric power. The same system used by it has been adopted for this international line, namely, 1,500-volt direct current with catenary construction. The locomotives used on the line are of the BB type with all four axles motor driven. The locomotives have a continuous power output of 1,000 hp. and a one-hour output of 1,400 hp. The maximum speed of the passenger locomotives is 75 km. (47 miles) per hour. On sections with the steepest grades, two locomotives are required to haul the trains. Hydro-electric power is used and is transmitted three phase. The particulars given were obtained from *Le Génie Civil.*

# The Readers' Forum

## Service Is a Vital Factor

To the Editor: Nov. 3, 1928.

While it is admitted that our equipment must have a civic attractiveness, we must not lose sight of the fact that: "Pretty is as pretty does," and without good service the latest models and the smoothest running cars will not avail.

It has been stated that the man in the front and the man who collects the fares can either help or hinder a street car system, and we know the truth of the statement. After reading that statement, which emanated from the Cleveland convention, one of the first things that flitted through my mind was the necessity of the motorman and the conductor being on the alert at the safety zones.

There are many times when the vehicular traffic is heavy and passengers cannot get from the sidewalk to the safety zone while a green light is showing. Coming with the heavy traffic is the street car and with no one in the loading space and no one to alight, the car lumbers away with many passengers trying to hail the attendants. The men swear and the women wring their hands, and right there we lose friends, and we lose many during a day with this kind of work. Also, we advertise the "supposed fact" that if we want to get anywhere we must ride the automobile.

The green or other lights only remain lighted for about half a minute and the car attendants should remain in stop position until the traffic light turns red. This would permit the waiting car passengers to wedge through and gain their objective, to get home on the street car. This practice would make friends for the company and, incidentally, increase the number of fares. Service is a vital factor and the greatest of attention must be paid to details like these if the service is to be made salable.

J. B. D.

## Co-operative Educational Plan Successful

The Milwaukee
Electric Railway & Light Company
Milwaukee, Wis., Oct. 31, 1928.

To the Editor:

Readers of your paper who read the editorial entitled "Educating Employees a Good Investment," published in your issue of Oct. 20, 1928, page 709, may be interested in a co-operative educational plan developed in Milwaukee, in which we are dealing with the problem discussed in that article in another way.

More than five years ago a group of people from some of the larger corporations joined in planning a course given at night to men who had completed high school or who had partly finished college work in engineering. The course was adopted and put into operation by the Milwaukee Vocational School. Its first graduates finished last June. The subject matter in the senior year is precisely the same as that found in senior work in a good college course. The enrollments are growing year by year. Five men from the rolling stock department of this company started in on this plan this present year.

The course is a heavy one, but we have gone far enough with it to know by graduates that it is a good one and leads to better results than could easily be anticipated, considering the time spent in the classroom.

Arthur J. Rowland,
*Educational Director*

# Could You Use

## $5?
## $25?
## $200?

SEND in your items for Electric Railway Journal's Maintenance Contest. You are sure of $5, as that amount is paid for each item published regardless of whether it wins a prize or not.

There are twelve $25 departmental prizes to be awarded to individuals sending in winning maintenance ideas. These will be divided equally between the following four maintenance divisions: (1) Rolling stock and shops; (2) way and structures; (3) electrical and line; (4) buses and garage, including shop equipment for bus maintenance.

The most sought after prize of all will be the $200 individual prize to be awarded at next year's annual convention to the person submitting the best maintenance idea during the contest.

An attractive trophy will go to the company making the greatest contribution to improve maintenance through participation in the contest, and special certificates of merit will be awarded each department making the best individual showing.

The first thing to do is to read over the instructions and conditions of the contest as published in the Oct. 20 issue of Electric Railway Journal, pages 724-725. An attractive folder has been prepared, giving full information and suggestions for preparing items for the contest. This will be mailed upon request. Copies of the folder for posting on bulletin boards or distribution among maintenance men are available.

Don't delay in getting started! There is no limit on the number of items that may be sent in by one person. The more you submit the better chance you have of winning one or more of the big prizes. Some companies are organizing all maintenance departments to go after these awards. Look up the announcement in the Oct. 20 issue of the Journal, or send for copies of the instruction folder!

# Time and Labor



Wood strip blanket used to protect commutators on Staten Island Rapid Transit Railway

## Wood Strip Blanket Protects Commutators

WHEN commutators are unprotected in the shop, after being turned and slotted they are very often damaged when being transported or handled. To decrease this possibility, the Staten Island Rapid Transit Railway, Staten Island, N. Y., uses a wooden strip protective blanket around the commutator.

This blanket is made from a number of $1\frac{3}{4} \times \frac{3}{4}$-in. wood strips 8 in. long, spaced so that radial flexibility can be obtained. They are fastened together by two pieces of $\frac{1}{8}$-in. soft drawn wire, held to the strips by $\frac{1}{2}$-in. staples. One of these blankets, installed on a commutator, is shown in the accompanying illustration. This blanket eliminated the danger of mechanical injury to the commutator during handling and shipment and while the armature is being installed in its frame.

The protective features of this strip blanket have decreased materially the commutator maintenance costs on this property.

## Oil Filter Reduces Compressor Maintenance Costs

BOTH the quality and quantity of compressor oil used must receive careful consideration if the maximum life and uninterrupted service of the compressor bearing surfaces is expected. This fact is appreciated on the Staten Island Rapid Transit Railway, Staten Island, N. Y. Not only is the oil selected carefully by this company, but it is changed periodically and especially at certain seasons of the year. At one time the old oil was thrown away, but it represented a large sum of money.

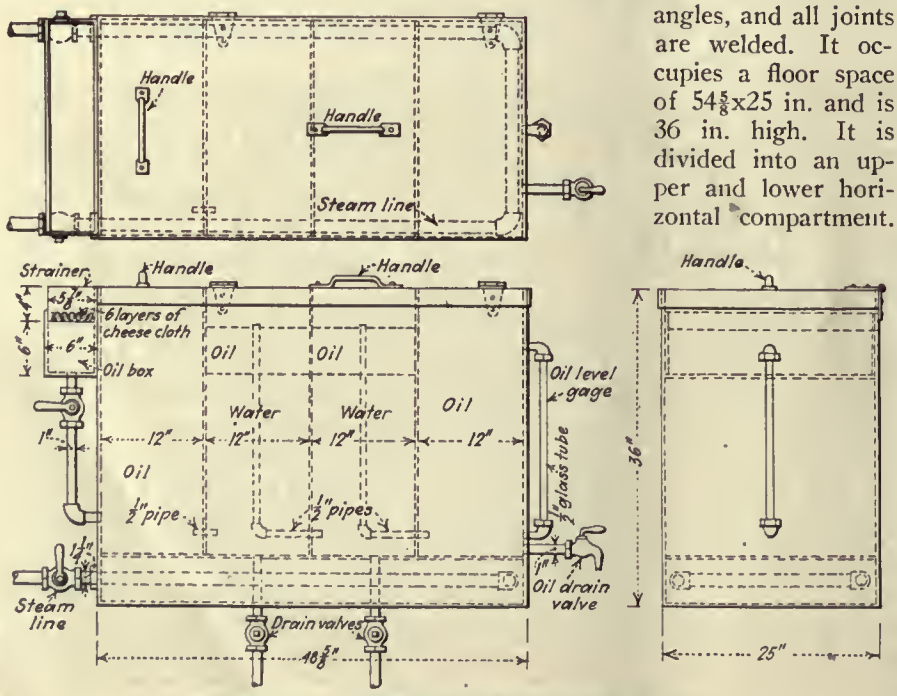
After extensive experimenting a purifying or filtering tank was designed and constructed in the shop. This is made from $\frac{1}{8}$-in. plates, $\frac{3}{8} \times 1\frac{1}{2}$-in. channel and angles, and all joints are welded. It occupies a floor space of $54\frac{5}{8} \times 25$ in. and is 36 in. high. It is divided into an upper and lower horizontal compartment. The lower compartment is equipped with a circular steam coil made from $1\frac{1}{4}$-in. pipe. The upper compartment is divided into four vertical compartments 12 in. wide. A strainer 4 in. deep and $5\frac{7}{8}$ in. wide is installed on the upper left-hand corner of the tank. This strainer extends across the entire width of the tank and fits into an oil reservoir 6 in. high, 6 in. wide and 25 in. long. The bottom of the strainer is provided with six layers of cheese cloth which can be renewed readily. The oil reservoir is connected to the first vertical compartment by a 1-in. pipe.

The old oil is poured into the strainer and flows to the first compartment through the 1-in. pipe. The second and third vertical compartments are partially filled with water. A $\frac{1}{2}$-in. pipe nipple installed in the partition between the first and second compartments permits the old oil to flow from one compartment to the other and to float through the water to its surface. A $\frac{1}{2}$-in. stand pipe is erected in the center of the second and third compartments and extends through the base of the partition, between the second and third and the third and fourth partitions. This permits the oil which has filtered through the water to overflow into those pipes and pass from the second compartment to the third and from the third compartment to the fourth. The fourth compartment contains the purified oil. Oil and water temperature is controlled by the steam supply in the steam coil installed in the lower compartment. A glass gage connected to the fourth compartment shows the height of the purified oil. A 1-in. pipe connection installed near the base of the fourth compartment provides for withdrawal.

COMPARISON OF OLD, NEW AND FILTERED OIL

| Sample | No. 1 | No. 2 | No. 3 |
|---|---|---|---|
| Gravity..... | 20.8 deg. B. | 23.0 deg. B. | 22.2 deg. B. |
| Flash point.... | 375 deg. F. | 400 deg. F. | 395 deg. F. |
| Fire point..... | 415 deg. F. | 440 deg. F. | 435 deg. F. |
| Viscosity at | | | |
| 100 deg. F... | 317 seconds | 310 seconds | 326 seconds |
| 130 deg. F... | 140 seconds | 136 seconds | 144 seconds |
| 210 deg. F... | 48 seconds | 50 seconds | 50 seconds |
| Color..... | Reddish brown | Reddish brown | Brown |

Sample No. 1—Represents new oil.
Sample No. 2—Represents oil removed from the compressors and filtered.
Sample No. 3—Represents oil removed from the compressor, but not filtered.
Sample No. 3—Contained dirt and moisture.



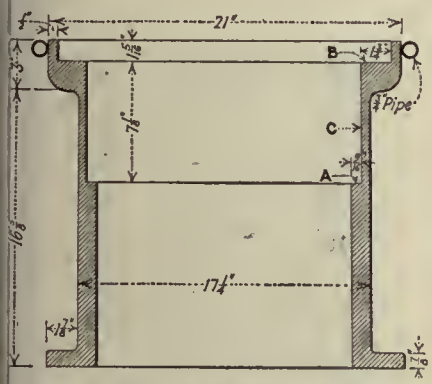

Oil filter used by Staten Island Rapid Transit Railway

# aving Ideas
## *from Staten Island*

This equipment has been found very satisfactory, not only because of simplicity of its design but from an oil purification standpoint. The same oil can be used over and over. The characteristics of the purified oil compared with new and unfiltered oil can be seen in the accompanying tabulation. Oil for seasonal changes consists of 75 per cent filtered oil and 25 per cent new oil.

### Commutator Soldering Cylinder

SOLDERING of armature leads in the commutator ears of the G-E 282A armatures was always a slow and tedious job in the Clifton shop of the Staten Island Rapid Transit Railway, Staten Island, N. Y., until Machinist Joseph A. Collins designed and installed the soldering cylinder




Section of soldering cylinder

shown in the accompanying illustrations. This cylinder is an iron casting and has an outside top and bottom diameter of 21 in. It is designed with three bores, a top, middle and bottom. The top bore is of 20-in. diameter, the middle 16.5 in. and the bottom 15⅜ in. A ¾-in. iron gas pipe is fitted neatly around the outer surface near the top and is held in place by substantial clamps. This pipe is drilled with 1/32-in. holes on 4-in. centers, so that the gas flame will strike the surface of the cylinder at the proper angle. The end of this pipe is fitted with suitable valves and unions as well as an air connection for controlling the character of the flame.



Exterior of soldering cylinder

The commutator to be soldered is placed vertically in the cylinder so that the end of the commutator bars adjacent to the string band rests upon the surface *A* shown in the sketch. The entire surface of the commutator as well as that of *C* in the cylinder is chalked so that any overflow of solder will not adhere. If the commutator is undersize so that an air space exists between the bars and *C*, the space is filled with powdered chalk. The flame plays upon the cylinder and gradually transmits heat to the commutator bars and raises the temperature to that proper for soldering. Solder is applied to the ears and floated in from the surface *B*.

It is claimed that since this commutator soldering method has been in use all trouble caused by the improper soldering of the ears has disappeared. It is further claimed that a greater number of commutators can be soldered in a given time compared with the discarded method and as a result maintenance costs have been decreased.

### Storage System Eliminates Delay

TO FILL orders rapidly, determine the amount of stock on hand and simplify the annual inventory, the Staten Island Rapid Transit Railway, Staten Island, N. Y., stores all shop material in metallic or wooden bins when possible and places the name, size and other characteristics of the material on a tag appearing above the center of each bin.

Bins are stacked in tiers and each tier is separated by a 1/16-in. sheet iron plate. The quantity of material in the lower tier is painted on the front of each partition and, directly over this, the amount of material in the first and second tiers. Above this, the sum of the first, second, and third tiers appears, and this idea is carried on through to the top tier.

This storage arrangement makes it easy to tell, at a glance, the exact amount of the total stock in each bin and practically eliminates the need for counting. The accompanying illustration shows the construction and arrangement of the bins as well as their contents, the tags, and the numbering on the partitions.



Bin arrangement for storing railway supplies

# New Equipment for Better Maintenance

## Line Starter for Shop Motors

FOR starting and protecting small induction motors used for driving machine tools, woodworking machines, pumps, fans, and many other machines where remote control with complete protection to operator, motor and machine is desired, the Westinghouse Electric & Manufacturing Company has developed a new line starter. It provides an unusually desirable feature in its adaptability to either hand or automatic reset after an overload, which is unique for this class of starter. It comes equipped



New line starter for shop motors

with hand reset of the thermal overload relay, but if automatic reset is desired the hand reset lever can be removed and automatic reset obtained. The automatic reset is convenient where the small starters are housed within the base of the machine they control.

The cabinet housing the mechanism of the line starter was proportioned from the standpoint of the man who does the installation and maintenance work, ample space being provided at both top and bottom for drawing in wires and making connections without the necessity of removing the mechanism from the cabinet.

Thermal overload protection is provided. The thermal operating elements consist of high temperature metal strips which are deflected due to heat from heater elements when the motor is overloaded.

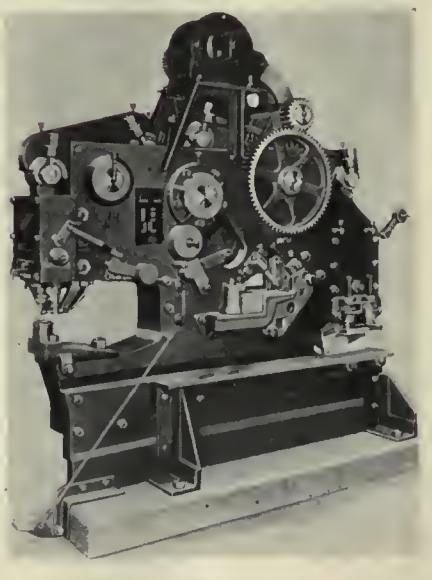
All operating parts are attractively finished to prevent corrosion and maintain good contact between parts. The copper and brass parts are tinned, while the iron and steel parts are cadmium plated. The approximate dimensions of the dust proof enclosing cabinet are 8½ in. wide by 12½ in. high by 5¾ in. deep, and the approximate shipping weight is 15 lb.

## Improvement in Universal Iron Workers

TWO new Universal iron workers have been brought out by the Buffalo Forge Company, Buffalo, N. Y., to meet the need of shops and blacksmith departments. The most recent machine is a combination slitting shear, punch and bar cutter, and has several new features. The throat is lower than in previous designs, which permits a compact, powerful design with less bulk.

One eccentric runs all three tools, consisting of the punch, shear and bar cutter. That is, all three tools are actuated during the course of one revolution of the eccentric, but not at the same instant. This prevents overloading the machine and yet permits using the three separately controlled parts of the machine at the same time.

Interchangeable high and low die blocks on the punch end take care of beams, channels, girders, and H sections, although not in so great a range of sizes as in the larger machines. The stripper swings out of the way when changing tools.



New Universal iron worker

Shear blades are exceptionally long and are reversible. Angles can be cut on a miter without inclining the stock.

## Improvements in "Dinkey" Controller

SEVERAL improved features incorporated in the "Dinkey" type controller, are announced by the Electric Controller & Manufacturing Company, Cleveland, Ohio. Among these are the use of ebony asbestos in place of slate, ventilated contacts raised $\frac{9}{16}$ in. from the dial face, and



Exterior view of improved controller

contact supporting lugs attached to the front of the dial, which are removable from the front. The contact lug has a single square head set screw to clamp the lead wire tightly. A welded steel frame is used and the main arm is carried on ball bearings. A smooth center top of the roller type is provided. The bearing spider casting supports the dial as well as the arm and quadrant bearings. This insures correct alignment and even contact pressure. Nickel alloy resistors are incorporated.

# Association Activities

## Better Service and Maintenance Make Transportation More Salable*

By John H. Walsh
*Superintendent of Rolling Stock and Shops Middlesex & Boston Street Railway, Newtonville, Mass.*

WE ARE in this business of ours primarily because we like it, and secondly to sell our goods, whether it be merchandise or transportation, to the best possible advantage. To make our transportation salable we must be everlastingly on the alert to take advantage of each and every opportunity to improve our service and better our product.

Only after making our service reliable, fast and comfortable, can we hope to educate our patrons who own automobiles to use our service more frequently. Next to courtesy and speedy service, a passenger's comfort should be considered. Due to the efforts of the automotive industry, the people have become more and more accustomed to a luxury in travel which was unheard of a few years ago. So, nowadays, railways are equipping their cars and buses to the end that a ride of such luxury and comfort may be given that patrons will become regular riders by choice rather than occasional riders of necessity.

The bus of today is built with low, pleasing lines, lacquer finish, special-designed chassis with long wheelbase, balloon tires, air brakes, more powerful motors, plate glass windows and special bus seats, designed to permit more knee room and constructed with combination deep coil springs and air bag cushions. Lighting fixtures are attractive and provide ample light, floors are covered with linoleum, aisles are wider and headroom is increased. All of these improvements were made to add to passenger comfort and while most of these changes meant an increase in the initial cost of the bus, in the light of our experience the end certainly justified the means.

Good service to the passenger depends in a large measure on good maintenance, coupled of course, with a courteous and efficient operator driving a clean, attractive and comfortable bus. A passenger rarely sees the officials of a street railway and seldom, if ever, realizes the extent of the repair shops, stock rooms, etc., which a street railway maintains to insure the passenger uninterrupted service. Therefore, it is imperative that the bus in which a passenger rides be kept in its highest state of efficiency and comfort; that the operator be trained so that he may reflect the courtesy and service which any progressive management wishes shown the passenger. The operator must have the necessary knowledge to detect readily any unusual behavior of his bus, and sufficient knowledge to make any necessary repairs of a minor nature.

Eternal vigilance must be exercised in the maintenance of buses to obtain lower repair costs, while improving the mechanical condition of the equipment. Buses having damaged body panels as a result of collision must be repaired and refinished as soon as possible following the accident, so the appearance of the fleet may not be marred. This practice also proves an aid in the follow-up of unreported collisions. All of our 82 buses in service, with the exception of 7 units, are finished in pyroxylin. This finish has been found an invaluable aid in keeping buses clean and in reducing frequency of refinishing periods, both of which aid materially in lowering maintenance costs. In the every-day cleaning of bus exteriors finished in lacquer, it has been found that the surface can be readily cleaned solely by the use of hand power and soft cloth rags, and that dirt and grit seldom, if ever, scratch or mar the finish. Another important reason for using lacquer is the closeness with which it is possible to match new colors of the same shade against the old lacquer. It is true that the cost of refinishing a bus with lacquer is somewhat higher than paint or enamel, and I appreciate that in its application to wooden surfaces the results are not satisfactory, but on aluminum-covered exteriors the psychology of the passenger who notes the approach of a bus that always seems to be clean and attractive, is sure to justify its use.

The Middlesex & Boston has instituted a number of preventative inspection methods in its endeavor to furnish a fast, reliable and comfortable service with as few interruptions as possible. Our operators at the completion of their run turn in defect blanks on which are recorded mechanical, electrical and body defects, and any other comments they may care to make concerning the operation of the bus, and these defects are then cared for by the night mechanic.

Buses are inspected daily for gas, oil, water and tires, as well as all body and running lights. Every 1,500 miles the bus is brought in the shop for an oil change and general inspection. The time of our general overhaul is determined not so much on a mileage basis as on the operating conditions of the bus as reported by our inspection department. At the present time buses are making an average of some 55,000 miles before being overhauled.

Believing that results are only as good as the men, methods, and machines at work, we have secured as mechanics, men who are specialists in the art of building and servicing of bus units. To enable these mechanics to perform their work with accuracy and dispatch, we have equipped our shop with a number of tools and machines, specially adapted for this work. "No Deferred Maintenance" should be the guiding watchwords of any progressive street railway, and should the opposite course be taken, unsatisfactory service is bound to result. Any method, tool or machine, which will increase accuracy, lower costs, and finally and most important of all, lessen the probability of the failure of any mechanical unit or part, should be put in use.

**Abstract of a paper presented at the meeting of the New England Street Railway Club, at Portland, Me., Oct. 18, 1928.*

### COMING MEETINGS OF *Electric Railway and Allied Associations*

*Nov. 13-16*—National Association of Railroad and Utilities Commissioners, New Orleans, La.

*Nov. 13-15*—Ohio State Safety Congress, Columbus, Ohio.

*Nov. 14*—Association of Electric Railway Equipment Men, Middle Atlantic States, semi-annual meeting, Hampton, Va.

*Nov. 21-22*—Public Utilities Association of Virginia, Hotel Roanoke, Roanoke, Va.

*Nov. 21-22*—Central Electric Traffic Association meeting, Auditorium Hotel, Cleveland, Ohio.

*Dec. 10*—National Highway Traffic Association, annual meeting, Automobile Club of America, New York, N. Y.

*Jan. 22*—New York Electric Railway Association, mid-winter meeting and dinner, Hotel Commodore, New York, N. Y.

*Jan. 23-25*—Electric Railway Association of Equipment Men, Southern Properties, and Southwestern Public Service Association, Mechanical Division, joint meeting, Houston, Tex.

# Win Back the Public With Modern Cars*

By R. T. Foster

*Superintendent Wason Manufacturing Company, Springfield, Mass.*

MANY of us have returned very recently from the A.E.R.A. convention at Cleveland, where we saw large cars, small cars, four-wheel, six-wheel and eight-wheel cars, some with rubber-tired wheels, some with steel wheels, and some with steel and rubber wheels. Let us pay the highest tribute to every designer and builder who exhibited there for they are all trying to help solve the problem of how to sell more rides to the public. Let us not fail to mention the bus manufacturers, for they too are offering new models and new designs for the same reason, namely, to help the railways sell more rides.

Street cars are still needed as part of our transportation system. In fact, you will all agree that should we discontinue the use of cars we would have much more difficulty than we now have from street congestion and it is of paramount importance that congestion be relieved rather than increased. Our car riding has fallen off. Why? The answer is competition. Cars have not been brought up-to-date, to correspond with American progress, and something more attractive, the private automobile, has taken away our rides. What are the advantages of the private automobile? The two most important are undoubtedly speed and comfort. The automobile of 28 years ago certainly was not as speedy, was not as comfortable and did not have the same general appearance as the automobile of today; neither does our electric car of 28 years ago resemble the present-day models. Yet many companies are wondering why the 28-year old car, or any of the early 1900 models, will not compete with the 1928 model automobile.

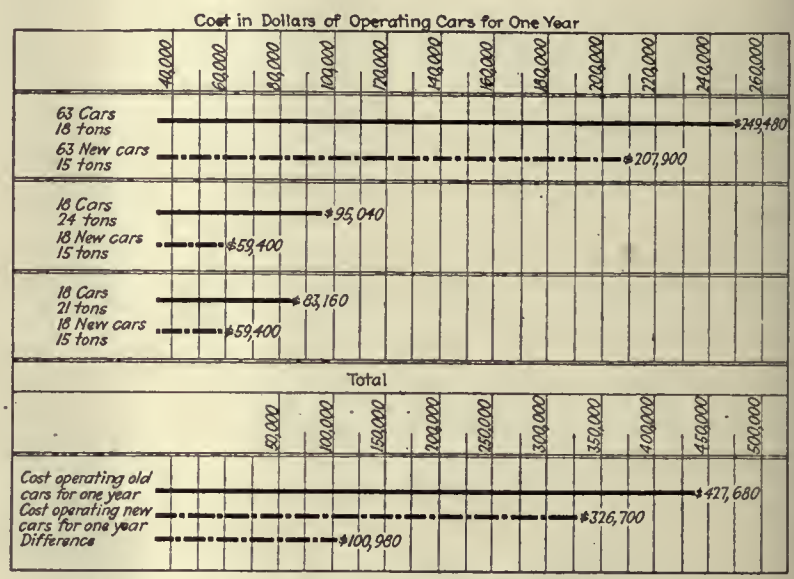
The car builders have designed lighter weight cars, more attractive cars and easier riding cars, with faster starting and stopping. The manufacturers of electrical and air brake equipment, the treadle door manufacturers and all others can give something better than they could many years ago. I agree that the railways cannot afford to buy all the newly designed vehicles of today any more than the manufacturer can afford to buy everything that is offered in the way of new machines. Some of the new machines are rather freakish and we do not buy them all, but on the other hand we always have and always will buy practical modern machinery.

The public does not want and will not use the same things they did years ago. Imagine the musical instrument manufacturers offering the public the old-fashioned organ, the stocking manufacturers offering anything but silk stockings, the automobile people offering our earlier touring cars without even wind shields. Would the public buy the old dusters and ride in them? No, they would not, yet some railway managers wonder why the public does not enthuse over the old model street car.

The public will help the street railways and will boost for them, if the street railways win back the public through modernization. A railway man recently told me that the new cars he put into service in his city changed the entire outlook of his company. The city government worked for them in stopping competitive bus operation and relieved them of a great deal of their snow removal cost; the operators seemed to have a new interest in their jobs, everyone feeling that he was working for a modern company instead of just an old-fashioned street railway; and most important of all, the public's feeling was even reflected in the law suits.

Figures for corresponding nine-month periods of an electric railway in Massachusetts, before and after the purchase of new rolling stock, show a net difference of $92,013. For the period preceding the purchase, the figures showed $50,820 in red; for the following nine months the records showed $41,193 in black. Before the purchase of new cars, the cost per car-mile was 0.479 cent, and the receipts, 0.434 cent. After the road was equipped with new cars the cost per car-mile was 0.352 cent and the receipts, 0.487 cent.

A railway in an eastern New York city, which operates 90 cars, found that the cost of operating old cars for one year was $517,066, while the cost for modern cars was $344,160, a saving of $172,906. The totals were arrived at by assuming the operating cost to be 11 cents per pound per year. Whether the 11 cent figure is right or half that amount is right, there is a saving you cannot afford to overlook. Do not forget that in addition to this saving you may win back public spirit. If you had the proper co-operation of the public and the city government could you not better survey and educate the public to the unfairness of some of their local ordinances? Could you not educate them that practically as many people travel in private automobiles over the paved surface of their city streets which you paid for and which you kept free of snow in winter, as did car riders who paid all the expense of this paving and this snow removal? Could you not win the support of the city fathers and get better results in the enforcement of parking regulations? Could you not get the public to work with you in the study of jump stops in your rush hours?




**Comparative operating costs of corresponding numbers of old cars and new, light-weight cars**

Could you not do hundreds of little things that you now find difficult of attainment, if you could win back the public's good will?

Do not overlook the trackless trolleys, or in other words the straight electric buses. Think of the economy of electric power, the dependability of it, the smoothness and quietness of starting and stopping, the possibilities of working with the city government to combine modern cluster or decorative electric street lighting with trackless trolley suspension arms on the same poles.

Another development in car and truck construction demands attention — the aluminum car and truck. If you can duplicate your present 32,000-lb. light-weight steel cars with 22,000 or 23,000-lb. aluminum cars, you can use four 25-hp. motors in the place of four of 35 hp. If you haven't even tried modern light-weight steel cars, compare 22 or 23,000 lb. against 42 to 68,000 lb. cars, which carry the same number of passengers. Think of the difference. Think of the life of your roadbed, rails, frogs and switches, the noise, the wear and tear caused by the heavy pound on every part of the car body and trucks, to say nothing about the cost of hauling it around and keeping it in repair.

**Abstract of a paper presented at the meeting of the New England Street Railway Club, at Portland, Me., Oct. 18, 1928.*

# News of the Industry

## $66,000,000 Terminal Plan

**Pennsylvania president stresses part elimination of P.R.T. underliers plays in his company's program**

"UNLESS the city of Philadelphia moves to get the P.R.T. underlying companies out of the way we shall be unable to complete the building of our new passenger terminal on the west bank of the Schuylkill."

That declaration was made according to the Philadelphia *Public Ledger* by W. W. Atterbury, president of the Pennsylvania Railroad, during a discussion of the railroad's plans to expend $100,000,000 for electrification.

In that same period the railroad will have spent upward of $66,000,000 additionally in the development of its terminal plans and allied improvements. Electrification of the road at Philadelphia will be co-ordinated with terminal construction, General Atterbury said, so that upon completion only electric trains will be operated in the new structure and in the underground suburban service, which will terminate in a new station south of the Parkway between Fifteenth and Sixteenth Streets. Mr. Atterbury was quoted as saying:

We were convinced before authorizing this great outlay that the city would carry out its agreement to have the Market Street elevated structure relocated under ground between the east river bank and a point west of Thirtieth Street and we are still satisfied that the city will proceed with the acquisition of the P.R.T. underliers so that improvement can be accomplished.

The job itself will be particularly difficult, because of the necessity of maintaining traffic while the underriver tube is being constructed. The project will require several years to complete and until it is started all our plans for the development of the terminal and the west bank area of the river must be held in abeyance.

The Union Traction Company, principal underlying company of the P.R.T. system, is the franchise holder for the Market Street elevated. Virtually all the underliers have signified their acceptance of the $139,000,000 total valuation placed on their holdings by the Public Service Commission. The Mackey Administration, as indicated elsewhere in this issue, plans to hold a special election in about three months to submit the proposed municipal acquisition of the underliers at that price to the voters.

General Atterbury pointed out that the act of Assembly authorizing the condemnation provided for the acquisition of all the underliers, thus making it impossible for the city to proceed for the taking over of the Union Traction Company franchise solely. He said:

If the city's program for condemnation fails we shall be left in a mighty difficult position. We will be faced with the necessity of completing a greatly needed public improvement, with the anticipation of seeing an unsightly elevated structure directly in front of the Market Street portals of the terminal.

## Better Maintenance Aim of Iowa Operators

Papers and discussions dealing with possible methods of reducing maintenance costs of railway and bus equipment without impairing service occupied the attention of the Operators' Section of the Iowa Electric Railway Association at the eleventh annual convention, held at Cedar Rapids, on Nov. 8 and 9. Discussion of both railway and bus problems was entered into heartily by the hundred or more delegates, presided over by E. J. Anderson, general superintendent of the Tri-City Railway, Davenport, Iowa. Of greatest interest were the papers dealing specifically with the care of equipment and property.

A full report of the meeting of the association at Cedar Rapids, with an account of the discussion, will be published in next week's issue.

## Franchise at Omaha Approved

**New grant sanctioned by voters at election on Nov. 6 will make it possible for company to carry out improvement program. Terms digested**

VOTERS of Omaha, Neb., at the election on Tuesday approved the new 30-year franchise for the Omaha & Council Bluffs Street Railway. Ten ballots in all were handed to each voter, but the only other matter on them of interest to the utilities was the county bridge proposal, referred to editorially in the ELECTRIC RAILWAY JOURNAL for Nov. 3. The bond measure was lost.

The vote on the franchise is interpreted as reflecting recognition by the electors of the fact that the railway has been doing its best to give the city efficient and courteous service and acceptance by the public at face value of the promise of the company to continue to render efficient service.

The street raiway franchise expired last May. The City Council authorized the railway to continue to use the streets until Nov. 6. The terms of the franchise were agreed upon after long study by the City Commissioners and the corporation counsel of the city. The franchise in full was published previous to the election as a paid advertisement in the newspapers, so that every phrase and every clause and every sentence could be studied at leisure. The contention of the company was that approval of the grant was needed if the railway was to be permitted to extend its financing and develop its property. At one stage of the discussion of the matter the company said:

We believe that an efficient railway system is one of the biggest assets a city can have. We know that traffic and transportation engineers agree that trolley cars propelled on fixed routes over steel rails must ever be the backbone of any city's transportation system. We know nothing comes so near the daily routine of the worker and the shopper, as the street car.

In its advocacy of the franchise the company among other things, said:

1. The proposed franchise contains every provision that the city asked for. The franchise ordinance was passed unanimously by the City Commission after long and diligent study by the commissioners and the city corporation counsel, Dana Van Dusen.

2. The franchise will enable the company to live and to do business in Omaha and to grow with Omaha as any other business wants to grow and develop. The franchise will enable the company to refinance and to make such improvements and extensions as may be needed. Failure to get a franchise would mean receivership because without a franchise it would be impossible to refinance the company, the bonds of which are now past due. All progress would then stop.

3. The street railway asks the franchise also because of its loyal staff of 1,100 employees. These men, heads of families, home owners many of them, worthy, law abiding, splendid citizens, deserve the vote of confidence of their efforts to give Omaha efficient tramway service.

### TERMS OF GRANT

The new franchise is for 30 years. It dates back to May 22, 1928. Since there was some question about the real date of the expiration of the franchise under which the company has been operating, it was agreed that should the grant which has now been approved be passed by the voters, the issue would not subsequently be raised about any inherent rights under the old grant. In other words the new grant is in the nature of a replacement ordinance. The principal provisions of the ordinance, abbreviated in their terminology follow:

Consent is granted to the railway and to its successors to construct, reconstruct, maintain and operate a street railway, motor bus and street transportation system, upon, along and across the streets and public ways, in Omaha, within the present and future boundaries thereof; but the right in all alleys, pleasure boulevards, park grounds, and all spaces between the estab-

lished curb line and the outer street boundaries not already occupied by tracks shall not be exercised unless special authority hereafter is granted or order made with appropriate conditions, at the option of the governing body of the city, acting by ordinance.

This consent shall fully terminate in 30 years from and after May 22, 1928, and on such termination, or at any time thereafter upon the order of the governing body of the city, the grantee, shall immediately discontinue all operation and remove all property from public streets and ways and restore same to good condition; neither the failure to order such discontinuance or removal nor the failure of the grantee, to discontinue operation and remove the property, nor the acceptance by the city of public service, the making of additional investment, the construction of extensions, the payment of taxes, fees and charges nor the regulation of rates and service, nor any act or failure to act of the governing body or the officials of the city shall confer any right whatever upon the grantee.

The rights, licenses, privileges and consent hereby granted cannot be renewed, extended, enlarged or amplified by user, occupation, investment, acquiescence, implication or estoppel, nor by the issuance or granting of any permits or by any act or failure to act by the governing body of the city nor in any manner except by the direct and new vote of the electors of said city.

This grant is not exclusive, and the city reserves the right to grant to other corporations or persons similar or other rights and consents upon the same or other terms and conditions, over the same or other streets and public ways; and also nothing herein contained shall deprive the governing body of the city of the right and power to grant licenses or permits to other auto or buses, taxicabs or vehicles to use the streets of the city in carrying passengers for hire.

The properties owned, shall, during the period hereof, be constructed, operated and maintained solely under the authority of and subject to this consent and no other claim or right, but shall be subject to assignment, transfer, lease, sub-lease, consolidation or merger under the laws of the state of Nebraska, but only when and if any and all interested parties are bound by and subject to all the terms and limitations contained in this ordinance, and then only to or with a corporation resident in Omaha and created by and existing under the laws of the state of Nebraska, a majority of whose directors shall be residents and citizens of the state of Nebraska.

All increases or changes in the railway and all additions and all supplementing or supplanting by bus or otherwise, shall become at once subject to all of the conditions and restrictions of this consent, including the time limitation. All property and operation outside of the city limits shall at once become subject solely to the conditions of this consent, including the time limitation, upon the extension of the boundaries of the city by annexation or otherwise, regardless of any grant under which same may have been acquired, constructed or operated.

The consent is limited to the operation of street cars such as are now in common use, propelled by electric power upon two parallel rails and not more than two parallel tracks or lines, upon the surface of the streets and by over-head trolleys, and to the supplementing and supplanting of such street cars by the operation of gasoline or electric motor propelled buses, over definite and regular routes along and upon the streets and public ways.

The consent extends to all parts of streets and public ways of the city along and upon which electric street railway tracks now owned and used by the grantee are located; and also extends to all other streets and public ways and all other parts of streets and public ways, subject to the limitation that such additional occupation and use shall in such instance be first authorized by the governing body of the city.

## Providing for the Future

THE governing body of the city, from time to time, by ordinance, may order and require such extensions of car lines or new lines, or supplemental or supplanting bus service, or transportation facilities as may be necessary for efficient and convenient transportation facilities throughout the city, consideration being given to the initial cost thereof, the resulting increased expense of operation, the usefulness of the proposed extension in connection with the system of transportation as a unit, and the length of the unexpired period of this consent. Such ordinance shall determine whether the extensions or new lines shall be by street car or by bus or otherwise, and shall be adopted by a vote of five-sevenths of the governing body of the city.—*Omaha Franchise.*

The consent given by this ordinance is limited to intra-city transportation exclusively, except that grantee is authorized to operate suburban, interurban or interstate electric or motor bus passenger transportation lines, by connecting same with its city lines or entering the city over the tracks or along the routes of grantee, for interurban transportation exclusively, and to be operated subject to all of the provisions of this ordinance and the legal requirements of Nebraska statutes. No local business shall be conducted on or by such lines, and grantee shall accurately segregate all investments, inventories, valuations, accounts and operation thereof. All such arrangements and relations for the operation of such suburban, interurban and interstate lines, shall be terminable at the option of the city in the event of purchase of the local lines of grantee by the city.

The grantee shall have the right to use viaducts and bridges constructed or maintained by the city only upon such terms, conditions and compensation as shall be provided, from time to time, by the present and future requirements of the city charter and city ordinances, and the right to use other viaducts and bridges upon such terms as may be agreed upon with the persons constructing, owning, or maintaining same, with and subject to approval by the City Council and in conformity to the city charter. Subject to such conditions grantee may be required to extend over or construct upon viaduct and bridges.

Grantee shall engage in no business other than the operation of transportation properties and shall acquire no properties other than such as are useful and used in such operation.

The grantee will obey the orders of the governing body of the city, with reference to the stopping points of cars, buses and vehicles for the purpose of receiving and discharging passengers.

Street car lines shall not be supplemented or supplanted, in whole or in part, by bus service, unless upon the city consents by ordinance.

The grantee agrees that it will pay such occupation taxes as may be levied by the governing body of the city.

The grantee shall be subject to and shall comply with all present and future statutory, charter or ordinance requirements, burdens and powers embraced within provisions as to the cost and expense of street maintenance and repair, paving and repaving, surfacing and resurfacing, and improving, and no exemption from any of these requirements, burdens and powers will be, directly or indirectly, granted by or derived from this consent, and the city expressly reserves all present and future requirements, burdens and powers with reference to the things enumerated herein.

The grantee agrees to carry without charge all members of the police force and all members of the fire department of the city while engaged in their official duties, and bearing official passes or recognition cards which shall be supplied by grantee.

The grantee shall, at its own expense, raise or lower all tracks to conform to grade or change of grade and to conform to the paved surface of any street or public way when paved, repaved, surfaced, resurfaced, or improved, and always so maintain them.

There shall be filed with the city clerk promptly when made certified copies of all financial statements prepared by the company for any purpose, all literature or reports used to promote the sale of stock or bonds or to inform the public or purchasers with regard thereto, copies of contracts relating to the sale or exchange of stocks, bonds and debentures, all appraisals or valuations and the annual report of the officers and the board of directors to the stockholders. The city shall have ten days notice of all applications to the State Railway Commission to issue securities, adjust fares, or otherwise to invoke the jurisdiction of said commission. The city corporation counsel, city attorney and city comptroller, together with any expert assistance, shall at all times have access to all the files, records, books, documents, accounts, reports and minutes of the grantee, except those pertaining to personal injury or property damage claims or litigation or to employment of employees, and shall be supplied with certified copies upon request. The city shall have the power to require an audit of the books and accounts of grantee at the expense of the city at any time.

Grantee shall annually file with the city an inventory and description of all additions and betterments and state the actual cost thereof and shall also present a detailed statement of depreciation and obsolescence during the previous year. Within 30 days after acceptance of this consent, grantee shall file a similar statement for the years 1920 to 1928, both inclusive. The city and the grantee agree that either of them shall be entitled to demand a revaluation of the properties of grantee used in local transportation, at any time or times when a period of five years shall have elapsed since the last preceding valuation or revaluation.

It is agreed that the city shall have the right to intervene in and be made a party to any suit or proceeding before the Nebraska State Railway Commission or any court involving in any way the construction or performance of the terms of any part of this consent or any suit to foreclose or enforce any lien, mortgage or trust against the street railway and transportation system, or any part thereof.

If the grantee shall wilfully refuse or neglect to comply with the provisions of this consent the governing body of the city upon the affirmative vote of 5/7 of the members shall have the power to revoke

and terminate all of the authority and rights granted by this consent, subject to judicial review in the courts of the state of Nebraska; provided, however, that no such revocation and termination shall be declared until after the grantee shall have been given a full hearing before the governing body of the city, to which hearing the grantee shall have 30 days notice.

If now or at any time within the life of this consent, the state of Nebraska or its Railway Commission does not have, or shall be held by a court of final jurisdiction to not have, or shall relinquish, in whole or in part, jurisdiction over and control of rates of fare and conditions of service, either or both, in whole or in part, then, to that extent and immediately thereupon, the governing of rates, fares and conditions of service with full power to fix rates and to establish and enforce service requirements shall be vested in and exercised by the governing body of Omaha, and its orders shall be complied with by grantee.

The city reserves the right at any time to acquire the property needed exclusively for local transportation purposes but there is to be no allowance for franchise value. All mortgages shall specifically recite this condition. In the event of purchase by it, the city shall have the option to terminate or cancel all leases, trackage agreements and other contracts.

By vote of the majority of the electors at an election called for that purpose, this franchise-consent shall be subject to direct amendment to remedy, alter or supply any provision hereof which may have failed, in whole or in part, due to its illegality; but no such amendment shall change the duration of this consent nor the royalty therein required to be paid.

This consent shall be void if not approved by the electors and if approved and adopted by the electors this consent shall be void unless within 30 days from the date of the election, the consent thus adopted and granted shall be unconditionally accepted in writing by the grantee duly authorized by the board of directors and stockholders and by the duly authorized trustee for the bondholders of grantee, and any bondholders and stockholders protective committees, for themselves, their successors and assigns, which instrument of acceptance shall, together with certified copy showing proper corporate and other action authorizing such acceptance, be filed in the office of the city clerk of the city of Omaha. Such acceptance shall constitute an abandonment, assignment, surrender and waiver of all rights, privileges, franchises, consents and authority previously acquired or claimed by the grantee hereof, it being the intention of this agreement to divest the grantee of every right of such nature existing or claimed to exist at the time of the acceptance of this consent.

## Power Show in Early December

MOTION pictures will feature the program of the seventh National Exposition of Power and Mechanical Engineering, to be held at the Grand Central Palace, New York City, during the week of Dec. 3-8. The films, which cover a wide field, include "The Age of Speed," "The Manufacture of Timken Steel Roller Bearings," "Freezing Out Fires," "Electrical Measuring Instruments," "Power" and "From Coal to Electricity." More than 465 exhibitors had registered at an early date and indications point to a higher attendance than last year.

## More Subway Talk in Cleveland

**Pennsylvania said to be behind Cuyahoga proposal about which facts are slowly coming out**

DETAILS of the organization and purposes of the Cuyahoga Subway Company, Cleveland, Ohio, are gradually seeping out, but the company still remains as great a mystery as it was when it was incorporated. Attorneys for the company, however, permitted it to be known that M. F. Bramley, president of the Cleveland Trinidad Paving Company, and owner of Luna Park, Cleveland amusement resort, was connected with the subway company. It was also said that Thomas E. Monks, vice-president of the Guardian Trust Company, Cleveland, was associated with Mr. Bramley. Mr. Monks, denied that he had anything to do with the subway company. Mr. Bramley at first said he was acting as "sort of a trustee for some other folks," but later it became known that he is president.

On Nov. 2 Cleveland newspapers received maps labelled "proposed Bramley tubes of the Cuyahoga Subway Company." The maps showed a layout of approximately 50 miles of subways, radiating in every direction from the Public Square, with a number of proposed crosstown and connecting routes.

What was regarded as a significant circumstance was the name "Pennsylvania" applied to a route projected in Superior Avenue N. E., to East 40th Street. The Pennsylvania Railroad crosses Superior at East 40th Street and apparently the only reason for designating this route as the "Pennsylvania route" would be to create the impression that it would have some connection with the Pennsylvania Railroad.

Since the Pennsylvania Railroad has declined to enter the Van Sweringens Union Terminal there has been a vast amount of speculation as to where the Pennsylvania will locate a terminal in Cleveland. There have been all sorts of stories about a rival terminal or rapid transit project backed by the Pennsylvania in competition with the Van Sweringens. One story is that the Cuyahoga Subway Company is fostered by the Pennsylvania Railroad.

Mr. Bramley declared that the subway maps had been sent out without his knowledge or consent. He declined to make any comment on the use of the name "Pennsylvania" in the description of the Superior Avenue subway. No announcement was made as to whether the company would build all the projected subways. Based on previous subway studies, however, it was roughly estimated that it would cost $500,000,000 to build the subways on the maps.

Petitions in circulation for several months which called merely for blanket authority under an initiated ordinance to construct and operate subways are to be scrapped, and new petitions are to be circulated which will indicate proposed routes, method of operation, rate of fare and the means by which the city will have some control or supervision over service. It was indicated that the proposed fare would not be a fluctuating one fashioned on the Tayler grant of the Cleveland Railway.

The company will propose to build and operate a subway system as a complete unit, entirely independent of the Cleveland Railway, it was learned.

All previous subway studies in Cleveland, particularly the proposal made by Raymond Cragin, which is up for consideration of the Cleveland Railway, have been based on the theory that transportation services in Greater Cleveland should be operated by one company. Backers of the Cuyahoga Subway Company are said to believe that the city is large enough for two systems, one above and one below ground.

## San Francisco Rejects Three Utility Measures

Three charter amendments of interest to private utilities and one of particular concern to the Market Street Railway, were all voted down by the electors of San Francisco at the general election on Nov. 6. Charter amendment No. 24, provided for the surrender of the expiring franchises of the Market Street Railway and the issuance by the city of revocable permits containing all the provisions of the existing franchises, including the 5-cent fare.

This amendment, it was urged, would tend to alleviate the complicated situation growing out of the fact that a number of franchises held by the company expire at different dates. A bitter controversy developed over the amendment.

Amendment No. 22 would have provided a local public utilities commission of three to be appointed by the Mayor of San Francisco with jurisdiction over all publicly owned and operated utilities. San Francisco now operates an extensive railway system in competition with the private company; has a municipal hydro-electric plant of approximately 100,000 hp. with a transmission line but no distribution system in the city, and has recently voted $40,000,000 in bonds for acquisition of the Spring Valley water system.

Charter amendment No. 23, was characterized by its opponents as the most dangerous proposal of the three. It would have set up a scheme for financing the acquisition or extension of public utilities by bonds authorized by a majority vote and payable as to both principal and interest out of revenue only. The amendment was intended to replace the present charter provision requiring a two-thirds vote on bond issues and limiting bonded indebtedness of the city to 12 per cent of the real and personal property in the city.

Unofficial returns for San Francisco showed the vote on the three charter amendments to be 67,771 in favor and 93,849 against amendment No. 24; 47,838 in favor and 74,092 against amendment No. 22; 34,852 in favor and 95,348 against amendment No. 23.

## Taxi War in Providence Makes Cabs Practically Jitneys

An effort to end the Providence, R. I., taxicab rate war will be made soon. Several taxicab companies now have a rate of 35 cents from the center of the city to any point within the city line, or from any point in the city to the center. Thousands of persons, especially school teachers and pupils, who ordinarily ride on the street cars are now using the taxicabs, it is reported.

Meanwhile Alonzo R. Williams, president of the United Electric Railways, intends to file a formal complaint with the Board of Police Commissioners, charging that the cut-rate taxis are guilty not only of "cruising" but of creating a serious traffic problem in Providence, already badly congested because of its narrow streets.

Officials of the cab companies deny their cabs are allowed to cruise and declare the low rate has brought them so much business over the telephone that they have their facilities taxed without seeking additional passengers by cruising. One company intends to add about 25 cabs to the 50 now in operation.

Mr. Williams charges that the taxis are so operated as to make the cabs almost jitneys, against which there is a law.

## Sunday Pass on Gary & Southern

Extension of the privileges of the Sunday pass plan to patrons of the Gary & Southern Traction Company was announced recently by the Gary Railways, Gary, Ind., under which management the Gary & Southern, recently purchased by the Midland Utilities Company, Chicago, is now being operated. The 25-cent Sunday pass, established last spring by the Gary Railways for the purpose of stimulating Sunday riding permits the holder to ride anywhere on the system as many times as he wishes on the date of issue. Passes are sold by all car operators and agents. Passengers travelling between Gary and Crown Point on the Gary & Southern line, however, will be required to pay a 10-cent cash fare per trip in addition to presenting the 25-cent pass. The regular single trip fare is 45 cents.

Sale of the Sunday pass has resulted in a marked gain in traffic and revenue on practically all divisions since the device was adopted, according to C. W. Gifford, general superintendent of the Gary Railways.

## New Order on Grade Crossings in Pennsylvania

Permission has been granted to the Reading Transit Company by the Pennsylvania Public Service Commission to operate one-man cars over grade crossings in Bridgeport and Norristown, Pa. The company asked the commission for a waiver of the general order which covers the operation of trolleys over grade crossings. The commission has directed the railway to place watchmen at three of the five crossings named in the petition for the waiver. The trolley tracks cross the right-of-way of the Pennsylvania and Reading Railroads in these two towns.

## Seattle Improvement Program

With the Seattle Municipal Railway, Seattle, Wash., needing approximately $700,000 in excess of anticipated revenues between now and next March, according to present estimates, to permit the railway system to meet its bond obligations, Mayor Frank Edwards and members of the City Council have under consideration an extensive reorganization and general improvement program for the lines. At an early meeting Mayor Edwards will lay before the members of the City Council utilities committee the salient features of the proposed reorganization plan.

Pending this meeting and the proposed full discussion of the railway problems, Councilman E. L. Blaine, chairman of the finance committee, states the Council will hold in abeyance preparations it has under way for another huge loan to assist the railway system in meeting its bond interest and redemption payments. Although the railway department still owes approximately $200,000 to the light department on a previous loan, which debt will be reduced to $100,000 before next March, it is planned to effect a loan either with this department or with the city water department, both of which are on a good paying basis.

City Councilmen are agreed that the municipal railway system must undergo some course of financial rehabilitation at once. A plan suggested by Councilman Otto A. Case is the rebonding of the system for approximately $25,000,000 to pay off its present debt and completely rehabilitate the physical property. The Case plan would entail passage at the next Legislature of a measure authorizing Seattle to refund its railway debt, and another granting the city a more liberal apportionment of the license and gasoline tax money from the state, together with authority to use it for the railway if necessary. It would provide for the replacement of the present heavy, cumbersome street cars with lighter, speedier, more comfortable ones. Councilman Case declares he is opposed to refunding the Seattle railway debt with a new issue of bonds which will be a general obligation upon the community, instead of being purely against the railway.

Councilman Oliver T. Erickson, long an exponent of municipal ownership, believes it will require between $5,000,000 and $10,000,000 to rebuild and re-equip the railway system to make it sufficiently attractive to win back patronage and convert the road into a financial success.

In the meantime, a committee of leading men and bankers of the city is completing a report, based upon an investigation, of the entire problem, which will be presented to the city within 60 days. When ready for submission, the program will represent the fruits of two years' intensive work by a small and anonymous committee of civic leaders, who have contributed their own time and have also retained expert engineers.

It is declared that one of the principal aims of the committee will be a rapid transit system which would lure citizens away from the use of automobiles in going to and returning from work. Another important phase is that of unification of the city's entire transportation system.

## Shoppers Limited on Excelsior Springs Run

The Kansas City, Clay County & St. Joseph Railway, Kansas City, Mo., put on the Excelsior Springs run on Nov. 1 the new Clay County shopper, a de luxe crimson limited coach, which will make four trips daily. The new service is designed particularly for shoppers living on the Excelsior Springs line, and the schedule will be arranged to serve these women. The new coach has been completely remodeled and newly equipped. It is an all-steel coach, with high-backed chairs finished in mohair and leather. The exterior is crimson with a cream top and black trimming. It is like the cars put into service on the ten limited runs to St. Joseph 60 days ago.

According to Robert P. Woods, president of the Kansas City, Clay County & St. Joseph Railway, patronage on the interurban cars has increased while patronage on the company's bus lines has decreased.

## Service Reduced on Iowa Line

The Fort Dodge, Des Moines & Southern Railroad has reduced its service between Fort Dodge and Des Moines, Iowa, from six to four cars each way daily, due to lack of patronage. Schedules have been arranged to give patrons a full day in either city.

## Would Remove St. Louis Utilities from Commission Rule

Mayor Victor J. Miller of St. Louis has stated that he is having a bill prepared for introduction before the next Missouri General Assembly removing St. Louis public utilities from control of the Missouri Public Service Commission.

## Poems on Car Service in Kansas City

The Kansas City Public Service Company, Kansas City, Mo., is offering $5 for each four-line poem accepted on the subject of the railway service. The contest has been going on for several weeks, and each week a different jingle is posted on a card in the rear of all cars. Largely humorous, the poems have attracted considerable attention.

# Recent Bus Developments

## Chicago Feeder Bus Hearings Concluded

Concluding testimony in the contest between the Chicago Surface Lines and Chicago Motor Coach Company as to which system shall operate motor coach extensions on the northwest side of Chicago was heard on Nov. 1 by the Illinois Commerce Commission. As a result of a ruling in which the commission reversed its original order authorizing the Surface Lines to operate feeder buses in this territory at a 7-cent fare with free transfers to street cars, the Chicago Motor Coach Company started a 10-cent service on approximately 70 miles of new bus routes on the same streets on Oct. 3.

Since that time representatives of numerous civic organizations from this section of the city have appeared before the commission asking that the decision favoring the Chicago Motor Coach Company buses be rescinded and the right to operate over these streets be restored by the state body to the Surface Lines' feeder buses.

An appeal from the commission's order authorizing service by the motor coach company at a flat 10-cent fare, has also been filed by the Chicago Surface Lines and city attorneys in the Circuit Court. The appeal is based on the allegation that the Commerce Commission had acted without hearing the side of the railway lines and the city. Ordinances approving feeder bus operations by the Surface Lines throughout the disputed area had previously been passed by the City Council over Mayor Thompson's veto.

In the final testimony presented before the commission, E. J. McIlraith, staff engineer for the Surface Lines, introduced evidence showing that patrons of the 7-cent joint feeder bus-railway service would save from 16 to 18 per cent of their time compared with the 10-cent service on the motor coaches in traveling between the northwest side and the downtown Loop district.

## Ten-Cent Bus Fare in Binghamton

Members of the Common Council of Binghamton, N. Y., have registered their approval on a projected ordinance providing for an increase of fare on the Riverside Drive and Seminary Avenue bus line, through adoption of an ordinance introduced by Alderman Earl B. Chubbuck. The increase is from 7 to 10 cents, with the privilege of purchasing four tickets for 30 cents. It establishes a uniform rate for bus and railway transportation in the city of Binghamton.

The action was taken upon recommendation of the joint committee on law and health-motor bus lines, to which the ordinance was referred at a previous session and in accord with the wishes of some 300 residents of the city who recently petitioned the Council to take such action.

The project finds a parallel in the franchise granted in 1927 by the Common Council to the Binghamton Railway Bus Lines, Inc., controlling the Riverside line, to operate the Rockbottom and Spring Forest Line.

## Favors Bus Service on Outlying Lines in Providence

Alonzo R. Williams, of the United Electric Railways, Providence, R. I., told the Public Utilities Commission, at a recent public hearing at the State House on a petition to abandon trolley service on the Washington-Providence and Crompton-Hope lines and substitute bus service, that authorization of the change would enable the company to give "more comfortable, faster and more frequent service" on all its lines in the Pawtucket Valley and between Providence and the Pawtucket Valley villages.

## Charge Made Against Stark Electric Dismissed

PETITION of the Salisbury Transportation Company, protesting fifteen-minute service between Canton, Ohio, and Louisville, a distance of 5 miles, and requesting that certain tickets and passes authorized by the Stark Electric Railroad be ordered discontinued, has been dismissed by the Ohio Public Utilities Commission at Columbus. The bus company contended that the Stark Electric Railroad is trying to destroy bus competition by the "unreasonable sale of tickets and passes and extra service." Officials of the bus company declared that service was being sold at less than cost and that revenue was not sufficient to meet depreciation costs. Officials of the electric road declared that the service at present rates is showing a profit.

In dismissing the petition, the Ohio board in its journal entry held that "there is no showing in the record which would warrant the commission in finding that the defendant is actually furnishing service for less than the actual cost, for the purpose of destroying competition or that defendant's rates are illegal, discriminatory, unjust or unduly preferential."

## Seeks to Abandon Service in San Leandro

Officials of the Key System Transit Company have applied to the California Railroad Commission for authority to abandon bus service in the city of San Leandro, Alameda County, which has been operated experimentally since May 3, 1928. Applicants state that the patronage of said line has not been sufficient to warrant its further maintenance.

## Problem of Interurban Bus Traffic

Regulation of interurban bus traffic is being considered in Kansas City, Mo., by the traffic committee of the Kansas City Safety Council. A set of recommendations has been prepared by the committee and at a meeting on Oct. 30, the report was referred to the board of governors of the Safety Council, which was scheduled to meet on Nov. 12.

It is agreed that the ultimate solution of the problem, which has grown out of the loading and unloading of interurban buses in the congested districts of the city, is the establishment of a common terminal, but the recommendations of the committee dealt with the immediate problem, regulating the number of discharges of passengers in the congested district, the number of pick-ups, and the bus route through the city. It has been found by survey that more than 200 buses are scheduled to leave Kansas City daily, and many of these lines have their terminals on the street.

The Safety Council has had the advice of owners and operators of interurban buses in their preliminary conferences on the subject. A proposed ordinance which would have prohibited the buses from entering the congested downtown district was opposed by the merchants, who believe that the downtown terminals help their business.

## Geneva-Waterloo Purlieu of Controversy

Competing bus lines figured in a spirited public hearing on Oct. 22, before the village board of Waterloo, N. Y. Applications were made by the Geneva Railway Bus Lines, Inc., subsidiary of the Geneva, Seneca Falls & Auburn Railroad, for a franchise to operate buses to Waterloo, and by the Finger Lakes Rapid Transit Company for a new franchise to carry passengers between Seneca Falls and Waterloo and eventually to extend to Geneva.

Attorney Lansing G. Haskins, president of the Geneva bus corporation, which now has a franchise to operate buses in the city of Geneva, represented the company. The company asked for a franchise which would enable it to abandon trolley service now carried on to Waterloo and replace this with buses. Mr. Haskins said that the company would give ade-

quate service with rates comparable with the present trolley fare.

Claude R. Mann, representing the Finger Lakes company, now operating buses between Waterloo and Auburn, applied for a franchise which would take away the present restriction preventing the company from carrying local passengers between Waterloo and Seneca Falls. Officers of the Finger Lakes company objected to the franchise to the Geneva Lines. They said that with four new buses they could extend the lines through to Geneva.

## Plans in East St. Louis

The Illinois Commerce Commission dismissed the application of the East St. Louis & Suburban Railway for a certificate of convenience and necessity for the operation of buses between Belleville and East St. Louis. Buses will be substituted for electric service on Dec. 1 between St. Louis, Mo., and East St. Louis, Ill., to Lebanon and O'Fallon, Ill., according to W. W. Welsh, vice-president of the company.

Three 40-passenger buses will be put into the service, operating from the Eads Bridge station in St. Louis over the Eads Bridge to East St. Louis to French Village, O'Fallon and thence to Lebanon.

The East St. Louis *Daily Journal* regrets that such substantial agencies of transportation as electric railways should reach that point where earnings do not justify continuance. It stated:

> It is our opinion that the bus line to Lebanon is to have its own difficulties, although they may be far in the future. The cry of railroad lines is partially justified that for many years they have been under an injustice in being compelled to pay a tax to help support a system of roads that provided competition for them to such an extent that dividends have been cut to a minimum and many railroads have been forced to go out of business. By the building of state highways at public expense, there has been created an adversary for electric lines of communication as well, caused principally by the public's use of highways thus depriving these connecting lines of their only source of revenue.
>
> The *Daily Journal* must not be understood as opposing bus lines. There are certain phases of the transportation scheme that nothing can occupy so efficiently or so economically, but we have never seen a modern city or a growing community discard its railway lines without noticing at the same time a certain decadence that is unpleasant to consider. There are twice as many people now in and near O'Fallon as were there when the rail line was laid that connected it. Yet, the changing times has routed the stable and dependable cars for speedier buses. It is a natural development of the age—but it is not one upon which any person who considers investment and the losses which accompany a change of the kind can contemplate with pleasure.
>
> It is said that other suburban connections are to be replaced by bus service unless the revenue increases. From this experiment in this section, we may be enabled to gain some idea as to whether it is better or worse, from a community standpoint. Very much indeed will depend upon the results of this initial attempt to replace the steel rails with buses.

## Safety Survey in Indiana

A state-wide survey of motor coach operations in Indiana is being made under the direction of the Indiana Public Service Commission to determine how fully the bus companies are observing the commission's recently adopted code of safety regulations. Through cooperation with state motorcycle police, watchers are being stationed at various grade crossings to ascertain the proportion of bus drivers who obey the new rule requiring them to bring their vehicles to a full stop before crossing the tracks of steam railroads and interurban lines.

According to Ross A. Greenwalt, motor coach inspector for the commission, motor coach companies of the state generally have shown a willingness to abide by the new ruling. In cases where state inspectors are riding in buses which fail to observe the regulation, personal warning is served on the driver. In other cases, the warnings are communicated to the company managements.

The campaign for enforcement of the new rule has been in progress for the last 60 days and will continue until satisfactory results have been obtained.

In addition to the crossing regulation, the commission now has in effect an order requiring that bus companies notify the commission immediately by telephone or telegraph, when mishaps occur that involve personal injury. Although the new regulations do not have the force of laws, it is pointed out that companies ignoring the rules are subject to the penalty of having their operators' certificates revoked.

## Petitions Filed in New York

Two petitions relating to transportation service in the city of Rome, N. Y., were filed with the Public Service Commission on Nov. 7. The Utica Railway Co-Ordinated Bus Co., Inc., asked for a certificate for the operation of a bus line over a new route to which the city consented on Oct. 29.

The New York State Railways also filed a petition asking the commission to permit it to stop operation on its trolley line in Madison Street for a period of at least one year, promising that if the petition is granted bus service will be provided in that territory under the application of the Utica Co-Ordinated Bus Line.

## Canton-Youngstown Service Improved

Joint bus and railway service between Canton and Youngstown, Ohio, a distance of about 50 miles, was started on Nov. 1 after the Ohio Public Utilities Commission approved plans for discontinuing the bus route between these two cities. This service is being offered by the Stark Electric Railroad and the Youngstown & Suburban Transportation Company, the latter controlled by the Youngstown & Suburban Railway.

Formerly, the Youngstown & Suburban operated buses every two hours out of Canton. Under the new schedule, Stark Electric cars leaving Canton on the hour connect with Y. & S. buses at Salem, 33 miles distant. In this way, service between Youngstown and Canton has been increased to hourly service instead of every two hours. Running time between the two cities under the joint plan is practically the same as under the previous bus system.

The Y. & S. now sells through tickets to points along the Stark Electric system while the Stark Electric sells through tickets on the Y. & S. to Youngstown.

## Privilege Granted St. Louis Public Service

The Missouri Public Service Commission revoked, effective Nov. 12, the certificate of convenience and necessity issued to the De Luxe Motor Company for the operation of buses between Maplewood, Webster Groves, Kirkwood and Brentwood in St. Louis County for its alleged failure to provide adequate and safe equipment and for other violations of the commission's rules. A certificate to operate buses between Maplewood and Kirkwood over virtually the same route used by the De Luxe company was granted the St. Louis Public Service Company.

## Would Discontinue a Los Angeles Line

The Pacific Electric Railway has applied to the California Railroad Commission for permission to discontinue operation on its Hyperion Avenue-Silver Lake-Glendale Boulevard motor coach line in the city of Los Angeles. Despite the payment of a subsidy by certain real estate interests the route continued to be run at a loss. This subsidy recently was withdrawn.

## Injunction Prevents Invasion at Crown Point

Through the issuance of an injunction recently by Judge F. M. Ridgely of the Gary Superior Court, the Midwest Motor Coach Company of Gary, Ind., was prevented from operating buses from Chicago, Whiting and Gary to the Lake County fair grounds at Crown Point, Ind., and entering into competition with the Gary & Southern Traction Company, which holds an exclusive franchise for passenger carriage between the cities of Gary and Crown Point. The temporary injunction was obtained by the company after several buses had been operated into Crown Point, where the 1928 county fair was at that time in progress. It was the intention of the coach company, which operates regular service between Gary and Chicago, to run buses to Crown Point only during the four days of the fair, but the restraining order placed the hearing date several weeks after the close of the fair.

# Financial and Corporate

## Affirmation Sought of Condemnation Figure Fixed for Fonda Road

Affirmance of the value placed on the line and right-of-way of the Fonda, Johnstown & Gloversville Railway, Fonda, N. Y., by the Appellate Division, third department, was asked of the Court of Appeals on Oct. 25 by former Governor Nathan L. Miller, appearing as special counsel for the Hudson River Regulating Commission, which seeks to take over the property by right of eminent domain.

The Appellate Division accepted the value placed by a board of appraisal at $1,442,139 as against the claim of $4,193,678 plus interest to be paid on the judgment, asked by the company. The property of the railway will be flooded in creating the regulating reservoir in the upper Hudson and Sacandaga Valleys by which it is sought to regulate the flow of the Hudson River, eliminating spring freshets and summer drouths.

The judgments from which appeal was taken determined the right of the board to take, in the name of the state, certain land of the railroad under the power of eminent domain. The proceeding was under both the conservation law and the condemnation law. Justice Crapser overruled all of the appellants' contentions and directed the final entry of the judgment confirming the report of the commissioners. Justice G. D. B. Hasbrouck wrote the prevailing opinion in the appellate division in which a majority of the court joined. Justice Hill wrote a separate concurring opinion in which Justice Davis joined.

The appeal involves various questions concerning the validity and regularity of the proceedings. The railroad did not contend that all of the conservation law was unconstitutional nor that any of the formal requirements were not duly taken up to the time negotiations were begun to take the appellants' property. The objections in the highest court are as to subsequent proceedings based on the failure of the board to comply with the provisions of the conservation law authorizing the taking of property for the purposes specified and on alleged errors of law of the commissioners in condemnation in receiving and rejecting certain items of evidence offered before them for the purpose of determining the amount of compensation to be paid the railroad company by reason of such taking.

The plans for the Conklingville Dam called for the relocation of several miles of track of the railroad. In its claim for damages the company estimated the work would cost $1,439,119; railroad damages $1,350,000; damage to Sacandaga Park $1,304,356 and administrative, legal and engineering expenses $100,000. The commissioners subsequently offered $1,442,130.

In January, 1925, the board made an offer of $550,000 to the railroad. Negotiations were broken off when the representative of the railroad insisted on recognition of the principle that consequential damages should be allowed. The attitude of the railroad, former Governor Miller told the court, was precisely the same it took in its original written summary of claims. He argued that no formal offer is necessary where the owner has demanded a sum which is far beyond the amount which, in the opinion of the plaintiff, the owner is entitled to receive.

Edward C. Bailey, one of the attorneys for the railroad, insisted that the final order should be vacated by the highest court, the report of the commissioners set aside and that judgment should be reversed and the petition dismissed.

## Traffic Fare and Wage Figures

The number of revenue passengers, including bus passengers, reported by 209 companies to the American Electric Railway Association for the month of September, 1928, compared with September, 1927, is as follows:

| | |
|---|---|
| September, 1928 | 776,274,742 |
| September, 1927 | 788,261,619 |
| Decrease, per cent | 1.53 |

The decrease in traffic is somewhat larger than has been recorded in the previous months of the year, which is probably due first to the fact that there were five Saturdays and Sundays in September, 1928, compared with only four in 1927, and second, to the fact that weather conditions in 1928 were exceptionally good throughout the month, thus promoting greater use of private automobiles and a lesser use of street cars.

Average cash fare in cities of 25,000 population and over were:

| | Cents |
|---|---|
| October 1, 1928 | 8.2155 |
| September 1, 1928 | 8.2155 |
| October 1, 1927 | 8.0449 |

The average maximum hourly rates paid motormen and conductors in two-man service by companies operating 100 or more miles of single track were:

| | Average Hourly Rate, Cents | Index Number 1913 = 100, Per Cent |
|---|---|---|
| October 1, 1928 | 57.52 | 211.08 |
| September 1, 1928 | 57.52 | 211.08 |
| October 1, 1927 | 57.28 | 210.20 |

The correction in the average hourly rate for September, 1928, from that shown in last month's service letter is due to a wage increase occurring since that time which has been made retroactive.

## Missouri Interurban to Be Sold at Foreclosure on Dec. 1

Announcement that all properties of the Joplin & Pittsburg Railway, Pittsburg, Kan., will be offered for sale to the highest bidder at an auction on Dec. 1, was made on Oct. 28 by John F. Layng, general manager for M. H. McLean, receiver. The sale will be made on orders from the federal court for the western district of Missouri.

## Reorganization of Schuylkill Property Asked

The Pennsylvania Public Service Commission at Harrisburg has been asked to approve petitions for the reorganization of the Schuylkill Railway, Girardville, Pa., which has been inactive for the last year. Since the company ceased operations the business has been handled by the Schuylkill Transportation Company. Receivers for the railway have secured court permission to sell their perishable property and this probably will be conveyed to the Schuylkill County Company, which formerly leased part of its property to the bankrupt utility.

A long strike, poor physical condition and declining revenues were causes which contributed to the receivership of the railway.

## Depreciation Hearings Scheduled in Baltimore

Hearing before the Maryland Public Service Commission of the depreciation issue in the case of the United Railways & Electric Company, Baltimore, is expected to begin in Baltimore on Nov. 15 or a few days later. The commission set this date tentatively several weeks ago when it also ordered a complete survey of the company's property. H. Carl Wolf, chief engineer of the commission, under whose direction the survey was made, has announced that all the field work has been completed and that only the work of compilation remains to be concluded. The survey was made necessary when the Court of Appeals ruled that the commission place the annual allowance for depreciation on present value of property instead of on original costs.

## Hearing Held on Union Electric Light Purchase

The Missouri Public Service Commission on Oct. 29 held a hearing on the application of the Union Electric Light & Power Company to purchase from the North American Company a number of electric power and light, gas and railway companies in East St. Louis, Ill., and vicinity. For the properties the Union Electric woud pay $18,111,000, part stock and part cash. It would give 420,000 shares of common stock on the basis of $25 a share and $7,611,000 in cash. Companies to be taken

over are the Union Electric Light & Power Company of Illinois; East St. Louis Power & Light Company; East St. Louis & Suburban Railway; East St. Louis Railway; St. Louis & Alton Railway; Alton Railway and Alton Gas Company.

The application has been taken under advisement.

## Detroit Earnings Decline

The income and statistical statement of the Department of Street Railways at Detroit for the year ended Sept. 30, 1928, compared with the previous year and for the month of September, 1928, compared with the similar month of 1927, follows:

INCOME AND STATISTICAL STATEMENT OF THE DEPARTMENT OF STREET RAILWAYS
CITY OF DETROIT

| INCOME | Month of Sept., 1928 | Month of Sept., 1927 | Year Ended Sept. 30, 1928 | Year Ended Sept. 30, 1927 |
|---|---|---|---|---|
| **Operating Revenues** | | | | |
| Railway operating revenues | $1,735,220 | $1,563,526 | $20,680,724 | $20,774,345 |
| Coach operating revenues | 239,374 | 268,911 | 3,248,867 | 3,209,136 |
| Total operating revenues | $1,974,594 | $1,832,437 | $23,929,592 | $23,983,481 |
| **Operating Expenses** | | | | |
| Railway operating expenses | $1,273,606 | $1,128,991 | $15,441,304 | $15,447,391 |
| Coach operating expenses | 238,567 | 263,493 | 3,214,287 | 2,905,667 |
| Total operating expenses | $1,512,173 | $1,392,484 | $18,655,592 | $18,353,058 |
| **Net Operating Revenue** | $462,420 | $439,952 | $5,274,000 | $5,630,422 |
| Taxes assignable to operations | 63,435 | 63,442 | 784,492 | 750,110 |
| **Operating Income** | $398,985 | $376,510 | $4,489,508 | $4,880,312 |
| **Non-Operating Income** | 20,291 | 20,171 | 235,627 | 258,860 |
| **Gross Income** | $419,276 | $396,681 | $4,725,135 | $5,139,173 |
| **Deductions** | | | | |
| Interest on funded debt: | | | | |
| On construction bonds | $64,592 | $64,592 | $785,875 | $785,875 |
| On purchase bonds | 11,185 | 11,649 | 139,848 | 145,500 |
| On additions and betterments bonds | 16,939 | 17,531 | 202,157 | 215,625 |
| On purchase contract (D. U. R.) | 60,750 | 59,572 | 697,798 | 749,786 |
| Total interest | $153,467 | $153,346 | $1,825,679 | $1,896,787 |
| Other deductions | 7,670 | 1,125 | 78,165 | 6,750 |
| Total deductions | $161,137 | $154,471 | $1,903,845 | $1,903,537 |
| **Net Income** | $258,138 | $242,210 | $2,821,290 | $3,235,635 |
| **Disposition of Net Income** | | | | |
| Sinking Funds: | | | | |
| For construction bonds | $42,715 | $42,715 | $519,709 | $519,709 |
| For purchase bonds | 10,931 | 10,931 | 133,000 | 133,000 |
| For additions and betterments bonds | 13,150 | 13,150 | 155,479 | 160,000 |
| For purchase contract (D. U. R.) | 146,919 | 146,919 | 1,787,518 | 1,787,518 |
| Total sinking funds | $213,717 | $213,717 | $2,595,707 | $2,600,227 |
| Residue | 44,421 | 28,492 | 225,582 | 635,408 |
| Total | $258,138 | $242,210 | $2,821,290 | $3,235,635 |
| **STATISTICS** | | | | |
| Railway revenue car-miles | 3,798,192 | 3,556,808 | 46,453,475 | 47,839,630 |
| Coach revenue coach-miles | 945,554 | 1,036,996 | 12,859,343 | 12,246,625 |
| Railway revenue car-hours | 374,902 | 348,120 | 4,591,842 | 4,804,143 |
| Coach revenue coach-hours | 86,690 | 95,980 | 1,183,569 | 1,187,958 |
| Railway revenue-passengers | 27,294,819 | 24,565,162 | 325,990,531 | 328,349,598 |
| Railway transfer-passengers | 9,846,653 | 9,323,513 | 119,391,717 | 118,708,228 |
| Railway total passengers | 37,141,472 | 33,888,675 | 445,382,248 | 447,057,826 |
| Coach revenue-passengers | 2,940,579 | 3,132,523 | 39,193,807 | 36,680,992 |
| Coach transfer-passengers | 348,151 | 378,107 | 5,245,599 | 3,795,420 |
| Coach total passengers | 3,288,730 | 3,510,630 | 44,439,406 | 40,476,412 |
| Total revenue and transfer passengers | 40,430,202 | 37,399,305 | 489,821,654 | 487,534,238 |
| Railway operating revenue per car-mile, cents | 45.68 | 43.96 | 44.52 | 43.42 |
| Coach operating revenue per coach-mile, cents | 25.31 | 25.93 | 25.26 | 26.21 |
| Railway operating expenses per car-mile, cents | 33.53 | 31.74 | 33.24 | 32.29 |
| Coach operating expenses per coach-mile, cents | 25.23 | 25.41 | 25.00 | 23.73 |
| Railway operating revenue per car-hour | $4.63 | $4.49 | $4.50 | $4.32 |
| Coach operating revenue per coach-hour | $2.76 | $2.80 | $2.74 | $2.70 |
| Railway operating expenses per car-hour | $3.40 | $3.24 | $3.36 | $3.21 |
| Coach operating expenses per coach-hour | $2.75 | $2.75 | $2.72 | $2.45 |
| Ratio of transfer passengers to revenue-passengers—railway, per cent | 36.08 | 37.95 | 36.62 | 36.15 |
| Ratio of transfer passengers to revenue-passengers—coach, per cent | 11.84 | 12.07 | 13.38 | 10.35 |
| Railway revenue passengers per car-mile operated | 7.19 | 6.91 | 7.02 | 6.86 |
| Railway transfer passengers per car-mile operated | 2.59 | 2.62 | 2.57 | 2.48 |
| Total railway passengers per car-mile operated | 9.78 | 9.53 | 9.59 | 9.34 |
| Coach revenue passengers per coach-mile operated | 3.11 | 3.02 | 3.05 | 3.00 |
| Coach transfer passengers per coach-mile operated | .37 | .36 | .41 | .31 |
| Total coach passengers per coach-mile operated | 3.48 | 3.38 | 3.46 | 3.31 |
| Ratio of railway operating expenses to railway operating revenue, per cent | 73.39 | 72.21 | 74.67 | 74.36 |
| Ratio of coach operating expenses to coach operating revenue, per cent | 99.66 | 97.99 | 98.94 | 90.54 |

## Revised Financial Plan in Chicago Expected

Members of the local transportation sub-committee which is engaged in working out a new program for settlement of the Chicago railway situation, were expecting this week a revised estimate from representatives of the surface and elevated lines covering the financial plan under which the proposed unified transit ordinance would operate. Preliminary estimates submitted last month by company engineers were summarily rejected by the Aldermen.

Pending the arrival of a new set of figures, Alderman Joseph McDonough, chairman of the local transportation committee, presented on Oct. 31 to the City Council a resolution calling upon the receivers of the Chicago Railways to refund $220,000 to the city which he claimed has been paid the receivers and officers of the railway as double salaries. These double payments, he charged in the resolution, are made as salaries under the corporate organization and under the federal receivership.

If the money is not paid promptly, the resolution asks the board of supervising engineers to determine whether the salaries are excessive and whether the Surface Lines can charge 55 per cent of them to the city. It points out that under the 1907 ordinances, the provisions of which are still in force under the extended franchise arrangement, the Surface Lines are required to pay to the city 55 per cent of their net receipts.

## Service in Alameda Curtailed

Discontinuance of all street railway and bus service in Alameda, except the new Webster Street-Central Avenue line and a small portion of the No. 9 rail route, has been announced by the Key System Transit Company, Oakland, Cal.

The routes to be abandoned include the so-called "dinkey" street car service over High Street from Santa Clara Avenue and High Street to Park Street and San Jose Avenue, the Santa Clara Avenue street car line from Park Street to High Street, the San Jose Avenue rail line from Park Street and San Jose Avenue to Ninth Street and Santa Clara Avenue, the Haight Avenue bus service from Webster Street and Santa Clara Avenue to Fourth Street and Haight Avenue and the temporary street car service over Santa Clara Avenue into Metropolitan Oakland during the peak hours of travel.

This leaves two lines serving Alameda, it was pointed out. The bus service over Central Avenue from Fernside to Webster and over Webster Street through the estuary tube, which replaces the Santa Clara No. 1 line under authority from the State Railroad Commission, is one service. The other is the No. 9 line. This crosses the Park Street bridge into Alameda. It will turn back now at Park Street and San Jose Avenue.

The abandonments of these services by the Key System was authorized in a recent decision by the State Railroad Commission. The Key pleaded its case for their abandonment upon the contention that the lines were a source of loss to the company and also constituted a duplication of service.

## Hearings in Case of St. Louis Holding Company Continued

The Missouri Public Service Commission has fixed Dec. 4 as the date for reopening the hearing on the application of the City Utilities Company, a Delaware corporation, for permission to increase its stock holdings in the St. Louis Public Service Company, St. Louis, Mo., to more than 10 per cent. Attorneys for the Delaware company informed the commission they required additional time to

prepare their case and to comply with the subpoenas issued by the commission for its books and records and a transcript of all of its corporate transactions since organization.

J. K. Newman, president of the holding company, and Col. Albert T. Perkins, vice-president, have been called as witnesses by the commission.

The application has been pending since early in this year following the reorganization of the United Railways.

## L. A. Busby on Chicago Surface Lines Prospects

Speaking before the Bondsmen's Club of Chicago, Leonard A. Busby, president of the Chicago City Railway, declared on Oct. 23 that the properties of the Chicago Surface Lines are in first-class condition and that the operation of them is conceded to be the best in the country. He said:

Holders of Surface Lines' securities may rest assured that they have a valuable property with large potential earnings. During 1928 the increase in revenue riders on the Surface Lines exceeds that of any other similar property in the United States. On the first twenty days of October revenue passengers increased 2,082,213 over the similar twenty days of last year, an increase of more than 100,000 revenue-passengers a day.

No other form of transportation in the world compares with ours. Motor bus cost of operation is 9 cents a passenger; street car cost of operation is 5.8 cents.

There are $165,000,000 of Surface Lines' securities to be refunded in the settlement of the railway problem, he pointed out. Of this, $95,000,000 is represented by first mortgage bonds and $70,000,000 in junior bonds and stocks. Mr. Busby continued:

Other than this provision will have to be made for $325,000,000 in additional securities in the next 40 years under the financing plan proposed by the City Council transportation sub-committee. Of this, $135,000,000 of new money will have to be furnished in the first ten years.

The Surface Lines securities have a sound basis back of them. There is a steady and large growth of population. Gross receipts of the Surface Lines in 1907, the first year of the ordinance under which we are now operating, were $18,823,094. In 1927 and 1928 these gross receipts were $61,624,752, an increase of 227 per cent. The residue receipts increased in that same period 137 per cent.

The capital account of the Surface Lines, $165,000,000, is extremely conservative. In 1925 the State Commission placed the minimum valuation at more than $200,000,000. The ratio of capital account to gross receipts in 1907 was 3.3 to 1; at the present time it is 2.7 to 1.

The companies have a renewal fund of more than $17,000,000 and in addition have spent more than $8,000,000 for the purchase of new cars and laying of new track, none of which has been added to the capital account. No other company in the country has a renewal fund equal to that.

Every dollar of outstanding securities is sound. We are at present negotiating an ordinance, which, if both sides agree, will be submitted to the next Legislature for approval and enabling legislation. I am still optimistic about the outcome.

## Net of New York State Railways Holds Up Well

The New York State Railways operating in Syracuse and other cities in Central New York reports for nine months ended Sept. 30, 1928, profit of $457,941 after taxes, interest, sinking fund, etc., but before depreciation, comparing with $618,025 in first nine months of 1927. For the quarter ended Sept. 30 profit was $102,913 before depreciation, against $139,269 in the preceding quarter and $149,981 in third quarter of previous year.

EARNINGS OF NEW YORK STATE RAILWAYS

| | 1928 | 1927 |
|---|---|---|
| Sept. Quarter | | |
| Gross | $2,232,658 | $2,331,158 |
| Balance after tax | 486,210 | 538,131 |
| *Net after changes | 102,913 | 149,981 |
| Nine Months | | |
| Gross | 7,302,335 | 7,535,008 |
| Balance after tax | 1,612,999 | 1,773,727 |
| *Net after changes | 457,941 | 618,025 |

*After sinking fund but before depreciation.

## Stock in St. Louis Sold

A block of 400 shares of preferred stock of the St. Louis Public Service Company, St. Louis, Mo., has been sold for $83 a share by the city of St. Louis, which received 16,000 shares of the stock in settlement of its mill tax claims against the defunct United Railways. The city advertised the stock for sale in blocks of 400 shares or more and received only three bids, each for a block of 400 shares. The highest bid was accepted. The city will offer more of its stock later.

## Situation in Twin Cities Reviewed

Figures furnished by Twin City Rapid Transit Company, Minneapolis, Minn., following the passing of the quarterly dividend on common stock because "earnings for past nine months did not warrant payment," show a decline of $61,000 in gross revenues for nine months of 1928 as compared with the corresponding period of 1927. Total revenue for nine months of 1928 (September estimated) is $8,853,820 compared with total revenues for the corresponding period of 1927 of $8,914,703.

REVENUE AND PASSENGER COMPANIES OF TWIN CITY SYSTEM

| | Number of Passengers | Total Revenue |
|---|---|---|
| First quarter, 1928 | 49,785,148 | $3,380,745 |
| First quarter, 1927 | 48,953,261 | 3,323,116 |
| First quarter, 1923 | 59,730,329 | 3,585,269 |
| Six months, 1928 | 91,883,928 | 6,248,092 |
| Six months, 1927 | 91,584,438 | 6,224,924 |
| Six months, 1923 | 115,352,395 | 6,926,642 |
| Nine months, 1928* | 130,091,887 | 8,853,820 |
| Nine months, 1927 | 131,013,541 | 8,914,703 |
| Nine months, 1923 | 166,929,596 | 10,026,559 |
| St. Paul City Railway | | |
| Nine months, 1928* | 45,461,370 | 3,104,098 |
| Nine months, 1927 | 46,762,565 | 3,192,644 |
| Nine months, 1923 | 60,082,918 | 3,604,975 |
| Minneapolis Street Railway | | |
| Nine months, 1928* | 80,224,270 | 5,485,187 |
| Nine months, 1927 | 79,862,766 | 5,457,061 |
| Nine months, 1923 | 99,879,445 | 5,992,766 |

*September estimated.

There has been a steady and consistent falling off in number of passengers carried and in earnings for the past nine years. The decline for the nine months of this year is attributable to operations in St. Paul. Minneapolis operations showed a slight gain. Early in 1928 the company proposed to raise the fare in St. Paul, although the fares have always been the same in St. Paul and Minneapolis. This plan now has been abandoned and it is understood that an effort will be made to increase the fare for both cities.

On Jan. 1, 1926, the fare was raised from 6 cents cash to 8 cents cash or 6⅔ cents for tokens purchased in lots of six or more. Under this method of increase the fare has averaged 6.8 cents. Despite this increase, total revenues for 1926 were smaller than for 1925 and the decline continued through 1927. Gross operating revenue for 1927 was $13,425,643, against $13,945,266 for 1926, and net income transferred to profit and loss for 1927 was $1,272,600, against $1,436,805 for 1926.

"Fair value" of Twin City Rapid Transit Company property has been set by the State Railroad Commission at $42,983,318. This does not include the bus-operating subsidiary, which is valued on company books at $1,264,992. "Fair return" on this valuation is set by the commission at 7½ per cent.

The commission's valuation of the company's property in St. Paul is $16,452,073. For the eight years (1920-1927) the amount required to give the "fair return" on the "fair value" was $9,598,331. The actual amount available was $4,683,391—a return of 3.66 per cent.

Number of passengers carried in St. Paul operation declined from 89,020,734 in 1920 to 63,810,891 in 1927. The decline was steady throughout the eight-year period.

## Income Larger in Springfield

The Springfield Street Railway, Springfield, Mass., shows a net income of $31,536 for the quarter ended Sept. 30, 1928, against $14,362 for the corresponding quarter of 1927. For the first three quarters of 1928 it shows net income of $180,915, against $163,476 for the first three quarters of 1927.

## Denver Doing Better

Net earnings of the Denver Tramway, Denver, Col., continued to show a gradual increase in the third quarter, although total operating revenue declined, the earnings statement for the first nine months reveals. H. S. Robertson, president, said:

Total operating revenue during the nine months period ended Sept. 30, 1928, decreased $67,843 in comparison with the same period in 1927.

Operating expenses for the period, as a result of strict economy and the fact that maintenance was subordinated to a reconstruction program and in some instances deferred, resulted in a reduction in

these expenses of $90,365. This accounts for the increase of $22,521 in net operating revenue for the period ending Sept. 30, 1928.

STATEMENT OF THE DENVER TRAMWAY AND THE DENVER & INTERMOUNTAIN RAILROAD WITH INTERCOMPANY TRANSACTIONS ELIMINATED

| | |
|---|---|
| Total operating revenue | $3,204,651 |
| Less operating expenses and taxes: | |
| Operating expenses (including depreciation) | 2,104,581 |
| Taxes | 379,845 |
| Total operating expenses and taxes | $2,484,426 |
| Net operating income | $720,224 |
| Total miscellaneous income | 26,816 |
| Gross income less operating expenses and taxes | $747,041 |
| Deductions from income: | |
| Interest on underlying bonds | 141,575 |
| Balance | $605,466 |
| Interest on general and refunding bonds | 240,366 |
| Balance | $365,100 |
| Net profit and loss credit less amortization of discount on funded debt | 12,411 |
| Balance available for dividend requirements on 104,412 shares of preferred stock | $377,511 |

Balance available for dividend requirements on 104,412 shares of preferred stock for the third quarter totaled $135,302, compared with $125,192 in the second quarter and $117,017 in the first quarter of 1928. Balance available for dividend requirements for the first nine months totaled $377,511.

Earnings on the preferred stock in the third quarter were at the rate of $1.30 per share as compared with $1.20 in the second quarter and $1.12 in the first quarter of 1928. Earnings on the preferred for the first nine months were $3.62 per share. This compares with earnings of $4.61 per share in the full year 1927, which is at the rate of $1.15 per quarter.

Total operating revenue for the first nine months was $3,204,851. Total operating expenses and taxes were $2,484,426, leaving net operating income of $720,224.

The dividend on the preferred stock was $1.25 quarterly until the last quarter of 1927 when the rate was reduced to 75 cents quarterly. At this time the company issued a statement saying that it was impossible to maintain the former dividend rate and keep the same high standard of service.

## Omaha Reduces Expenses

An improvement in the financial condition of the Omaha & Council Bluffs Street Railway, Omaha, Neb., is shown in the report for the month of September. While revenues decreased from $218,583 to $216,433 operating expenses were cut from $159,552 to $148,532. Net income from operation was $67,901, compared with $59,031 in September, 1927. After deducting taxes and other expenses there was a gross income of $40,303, compared with $31,638, leaving the company $5,171 short of meeting bond and other interest charges.

## Cortland Company Would Suspend Homer Line

Abandonment of the Homer-Preble line, near Homer, N. Y., which has been in operation for twenty years, is being sought by the Cortland County Traction Company on the ground that buses and private automobiles have made the line unprofitable. Proceedings have been started by the company through a resolution of the board of directors authorizing the officers of the company to petition the Public Service Commission for the right to suspend operations on the line. It is stated that the Delaware, Lackawanna & Western Railroad and bus lines provide adequate service.

## Agitation Over Underliers Revived

Mayor Mackey of Philadelphia revealed on Nov. 2 that he is going to engage in a vigorous "campaign of education" to win public support for the plan to have the city buy up the franchises of the Philadelphia Rapid Transit Company's underliers for $149,000,000. Protest prevented the plan being placed on the ballot on Nov. 6. The issue is to be re-submitted later.

# Book Reviews

### Gutachten über die Elektrifizierung der Strecke Wien-Salzberg

Julius Springer, Wien, 1928. 163 pages.

Some time ago the Austrian government appointed a committee of experts to study the desirability of equipping an important section of one of its main line railways, or that from Vienna to Salzburg, for operation by electricity. This report has been completed, and is now published in pamphlet form.

A list of questions was submitted to the committee covering various points on which earlier reports of the railroad administration and the electrical industry had differed materially. These included, for instance, the cost of electrically connecting the various power circuits, placed at about $2,350,000, or almost 12 per cent of the entire initial cost. The investment required for the whole project is estimated at $29,280,000, but the steam locomotives released for other service provide a credit of about $4,270,000. It is expected that power will be bought from existing power companies. The present capacity of the hydro plants in the Alps can be increased without excessive cost. Either a small hydro plant or an existing steam plant near the load center, operated by a power company, could take care of the basic load of about 10,000 kw. Two estimates, computed on different bases, give the annual energy required as 100,000,000 kw.-hr.

The opinion of the committee was not unanimous. The minority proposes the use of more modern steam locomotives instead of electric power. This would greatly increase the economy of steam operation and requires much less investment. The minority points out that no other country which has to pay as high interest rates as Austria and can be supplied from nearby coal mines (in Czecho-Slovakia), has undertaken to electrify its railroads.

The majority favors electrification, although for the first years of operation it is estimated that a small loss will result. This will change into a profit with the gradual amortization of the capital. Any increase in the price of coal, wages or volume of traffic would tend to usher in the period of profitable operation just that much sooner. Further, electrical equipment possesses certain factors which favorably influence the economic life of the country to a value that cannot readily be expressed in figures. Among these is the effect of decreased coal imports on the trade balance. Moreover, since adjoining lines in neighboring countries are electrified, or soon will be, it is advisable to complete the missing link promptly so that passenger and freight trains may be hauled by electric locomotives on a continuous line of 900 miles through the heart of Europe. It is recommended that the work be distributed over a period of five years so as to facilitate the change to electric operation and permit the gradual reduction of operating labor expected with electrification.

### American Society for Testing Materials

Headquarters of the society, 1315 Spruce Street, Philadelphia, Pa. 320 pages. Price, $1 to non-members; 50 cents to members for extra copies.

This yearbook, dated August, 1928, contains names of officers and members of the executive committee, society representatives, past officers, and general information relating to history, membership, meetings, publications, and other activities of the society.

### American Railway Signaling Principles and Practices—Chapters VII, VIII and XXIII

Published by Signal Section, A.R.A., New York. Price: first two, 15 cents per copy to railroad employees, 25 cents per copy to non-railroad employees; third, 10 cents and 20 cents respectively.

Very wisely the signal section of the American Railway Association is publishing its handbook on signaling principles and practices in installments. Altogether there will be 26 chapters, of which three were issued some time ago and three have just been published. These latter relate to direct current circuits, transformers, and highway crossing protection. The other chapters will be issued at the rate of about three a year.

# Personal Items

## George B. Avery to Run Seattle Road

Complete charge of the Seattle Municipal Railway, Seattle, Wash., is to be placed in the hands of George B. Avery, superintendent of public utilities, until the proposed reorganization program for the department can be perfected. Announcement of this effect was made by Mayor Frank Edwards, following the death on Oct. 27 of David W. Henderson, for years general superintendent of the system. The plan is understood to contemplate the immediate curtailment of expenses of the railway department, starting with a saving of $500 a month in salary for a separate superintendent of the department. It has the backing of the City Council at large, although there is some opposition.

As superintendent of the city's utilities Mr. Avery has supervision over the light, the water and the railway departments, as well as over the service of privately-owned utilities operating under franchise in the city. The appointment of a successor to Mr. Henderson is not contemplated at present, but divisional heads in the department will be directly under Mr. Avery. This plan was evolved during the time Mr. Henderson was ill, and appears to have grown into an accepted policy when it became evident that he would not return to the department.

# J. N. Shannahan Heads Advisory Council

### Former president of American Association and official of Omaha & Council Bluffs Street Railway chosen to succeed B. C. Cobb as chairman of body that guides policy of industry

NO MORE fitting appointment could have been made than that of John N. Shannahan, president of the Omaha & Council Bluffs Street Railway, Omaha, Neb., to the post of chairman of the Advisory Council of the American Electric Railway Association to succeed B. C. Cobb, for it was during Mr. Shannahan's administration as president of the association that the Advisory Council came into being as the successor to the committee of 100, formed during the war time.

It is at his own expressed desire that Mr. Cobb is retiring as head of the council. As was made plain at the time of the formation last spring of the Allied Power & Light Company to bring together the Hodenpyl-Hardy and the Stevens & Wood interests, Mr. Cobb has been gradually relinquishing the more arduous of his affiliations and when he expressed the wish to be relieved of the responsibility which he had carried since the formation of the Advisory Council, a committee was appointed consisting of R. P. Stevens, former president of the American Association and head of the Allied Power & Light Corporation; C. E. Grossbeck of the Electric Bond & Share Company, and J. J. O'Brien, president of H. M. Byllesby & Company, to co-operate with President Barnes in choosing a successor to Mr. Cobb. The members selected Mr. Shannahan, and secured his consent to serve.

Entirely aside from the element of recognition by the industry of the part that Mr. Shannahan has played in the past as a member of important committees of the American Association, as an officer of that association and finally in 1924 as its president in helping to shape the destiny of the local transportation industry, Mr. Shannahan's appointment



J. N. Shannahan

puts into the post of chairman an executive who helped not only to formulate the fundamental principles proclaimed by the Advisory Council some time ago, but a man who has made a fetish of every pronouncement set down by the committee as an obligation of companies engaged in furnishing local transportation. He has been in Omaha just about a year, yet in that short time he has installed no end of innovations and has just seen his work substantially recognized by a vote of confidence at the polls which carries with it a new franchise to his company for a period of 30 years. His work there may be said only to have just begun.

True, Mr. Shannahan has won over the public of Omaha to his company by a series of well-timed service and other changes in their interest, but work on the bigger program which he has in mind necessarily had to wait on the settlement of the franchise matter. As the vote just recorded in Omaha indicates, it pleased more than three persons out of four when Mr. Shannahan said some time ago about the new grant that "when I accept the franchise, I marry it; I accept it for better or for worse." People knew that he meant what he said, for his record was there to prove it, the record of a year of most strenuous work, some of the high spots of which were only hinted in the review in the JOURNAL of Oct. 13, page 695.

Mr. Shannahan's is a career around which a notable biography could well be written for popular consumption, but the record of his previous accomplishments has been covered before in the pages of the JOURNAL, notably in the issue of the daily published during the sessions of the American Association at Atlantic City in October, 1924, at which he was elected president of the association, and in the JOURNAL at the time of his accession to the post at Omaha which he now fills. It suffices to reiterate the statement that the avowed purpose of the Advisory Council is to interest owners of large properties more directly in the welfare of the industry generally, and to get the benefit of their advice and counsel at meetings held regularly, and then have the suggestions so evolved carried out through L. S. Storrs, the managing director. Probably no other man in the industry is better qualified than is Mr. Shannahan for this work and for the task of aiding the members of the council as their directing head in formulating plans for meeting such problems of the industry as the restoration of the credit of the railways, securing co-ordination of railway and bus service, effecting the modernization of properties and carrying through other outstanding tasks.

As indicated before, both at Omaha and in his other official capacities, Mr. Shannahan has applied all the principles that the Advisory Council has laid down as essential to successful local transportation because he has first secured from the public that measure of recognition of the rights of the railway upon which all accomplishments of a permanent character necessarily are presaged. In short, the record of his work is Mr. Shannahan's own best eulogy.

# OBITUARY

David S. Carll, vice-president of the Capital Traction Company, Washington, D. C., and the engineer who was in charge of the installation in 1897 and 1898 of electric lines of that company practically as they stand today, died at his home in that city Nov. 5. Mr. Carll went to Washington from Kansas City in 1890 at the time the lines of the old Washington & Georgetown Railway were being converted from horse to cable. He was chief engineer and superintendent, and held that position when the Capital Traction Company was organized in 1895 and took over the properties of the Washington & Georgetown. He had been an officer of the company since that time and a vice-president for about twenty years. Mr. Carll was born in 1855.

# Large Orders Ahead for Heavy Electric Equipment

**New York to ask bids on 300 subway cars. Pennsylvania Railroad asks bids on electrification. South Shore orders ten cars. Track projects in Washington, D. C.**

NEW YORK City Board of Transportation announced today that it will soon advertise for bids for the construction of 300 steel cars for service on the Eighth Avenue-Central Park West-Washington Heights line of the new subway system. Initial operation will probably be started early in 1930 from the Harlem River terminal at 207th Street as far south as Chambers Street, which will be a temporary terminal pending the completion of the East River tubes under Fulton Street to Brooklyn.

For nearly a year, the members of the board and its engineers have been consulting and conducting research on the design of a steel car. As a result it is expected that the cars of the city's new subway system will afford greater capacity and facility, will be faster in operation and have less crowding for the amount of traffic anticipated than other cars now in use in the city.

The new cars, as designed, will be 60 ft. 6 in. long, 10 ft. wide and 12 ft. high. The length will be 9 ft. and 2 in. longer than the Interborough Rapid Transit Company cars and about 7 ft. shorter than the single steel cars now used by the Brooklyn-Manhattan Transit company. They will permit easy movement of passengers through the end doors between cars, while the train is in motion.

The width and height of the new cars will be the same as the width and height of the Brooklyn-Manhattan Transit company cars. The new cars will have four double doors on each side, each doorway being 3 ft. 10 in. wide.

For initial operation, local trains will terminate temporarily at 168th Street and Broadway, while the expresses will go to 207th Street. The speed of the local service will be about the same as the present I. R. T. service, but the express trains between 207th Street and 42nd Street will be about three minutes faster than the I. R. T. expresses under the present schedule of service.

In order to determine structural clearances and demonstrate the arrangement of car body parts, the Board of Transportation for some time past has been working on a model section of a typical car in the office of the board's bureau of equipment and operation at No. 49 Lafayette Street, as shown in the accompanying photographs.

The arrangement of the seats is somewhat similar to the arrangement now in existence in the B.-M. T. cars, but in the city's new subway cars there is to be 2 in. more knee room between cross-seats than in the B.-M. T. cars. Each car will seat 60 passengers, and when filled with a standing load, each car will have a capacity of 282 passengers. The station platforms are 660 ft. in length, enough to accommodate a train of eleven cars, nearly 30 per cent more than the longest B.-M. T. train and 55 per cent more than the present Interborough trains of ten cars each.

The cars will be provided with white-enameled hand straps in front of the seats and vertical stanchions near the doors. The seats will be of heavy, natural-colored rattan.

Illuminated route or destination signs will be installed on the sides and at both ends of cars. These signs will carry a designated route number indicating the particular line the train is operating over—similar to route numbers now in use on some of the bus lines.

Each car will be equipped with five ceiling fans. The equipment of each car such as doors, fans, lights, etc., will be connected to permit operation from one or more positions between cars on the train.

### Pennsylvania Railroad Asks Bids for Electrification

Bids have been asked by the Pennsylvania Railroad, Philadelphia, Pa., for the electrification of its lines between Philadelphia and Trenton as the first section to be electrified under the $100,000,000 electrification program. Money has already been appropriated by directors to cover cost of electrification between Philadelphia and Trenton.

The second step will be electrification of the line from New York to New Brunswick. This line is already electrified from Newark to New York, although some modifications may be necessary in connection with the whole electrification program. The third step will be the tying together of New Brunswick and Trenton, which will permit of






At right—New York Board of Transportation has constructed a model of typical section of cars for new subway. At left—Interior view of section of new subway cars for New York

operation of through electric trains from New York to Philadelphia. Many details remain to be developed, and it is yet to be determined whether electrification of the whole road, freight as well as passenger, will be next pushed to Wilmington or whether electrification of the main line to Atglen will be taken up after the Philadelphia to New York stretch is completed.

The line between Philadelphia and Wilmington is at present electrified for local passenger service only. Electrification of the road between Philadelphia and West Chester has almost been completed for local passenger business and will be opened for service shortly.

### South Shore Orders Ten Cars

An order for ten more steel passenger cars, five motors and five trailers, has been placed by the Chicago, South Shore & South Bend Railroad, Michigan City, Ind., with the Standard Steel Car Company, Hammond, Ind.

Ten motor cars are under construction by the same concern now, to be delivered toward the end of the year. The new order brings the total of cars to be put in service during the next half year to twenty.

Specifications of both orders call for little change in the latest model of South Shore Line car. Individual easy seats of the bucket type, Pullman smoking compartments, wide aisles, large windows, "turtle-back" roof with raised ventilators, and spacious vestibules with low, descending steps are the important features.

Installation of the twenty new cars will give the railroad 50 steel motor cars and fifteen steel trailers.

### Extensive Track Projects in Washington, D. C.

It is estimated that the pending project for the extension of the Capitol Plaza Parkway in Washington, D. C., will cost the electric railways $500,000 in relaying their tracks. Under this plan it is proposed to take the tracks in the vicinity of the Union Station and the Capitol underneath the parkway in a subway. Stations will be built for the Senate and House office buildings. The federal government will pay for the construction of the subway but the grading and the cost of track relocation is left to the railways to pay.

This park extension plan has already passed the House and no opposition is expected to develop to it in the Senate next December. The car companies have no desire to take their cars off the streets in the Capitol area because much tourist business at present originates there.

A provision made in the Capitol Park extension measure provides for construction of subterranean garages of 400 car capacity to be used by Congressmen and employees of the Capitol. The lighting of the subway will be left to the street car lines. Besides the improvement projected for the Capitol area, the federal government has already approved a $500,000,000 park and building development in the triangle section between the Capitol, the Monument and Pennsylvania Avenue. This last plan not only calls for several subways but also requires extensive surface track reconstruction.

### Equipment Market Continues Good

During the past few weeks a number of railways have announced the completion of their track program for this year. Although the average volume of orders has decreased, a number of good size orders have been placed and several large projects have been announced. Chicago Surface Lines, Chicago, Ill., has placed orders for 110 80-ft. center radius switch tongues, 50 160-ft. center radius switch tongues, 6,500 lb. of high carbon welding rod, 2,000 lb. of high manganese coated welding rod, 4,000 lb. of low carbon coated welding rod of grade 200, 2,000 6x8-in.x8-ft. sawed red oak ties creosoted, 50,000 lb. of 1x4⅛-in. track bolts with square nuts, 24 spring switch throw boxes, 400 16x2¾x1¾-in. grinding wheels, 18,900 gal. of Tarvia-X and 8,900 gal. of Tarvia-A.

Creosoted pine ties numbering 3,200 and 1,000 white oak cross ties have been ordered by the Arkansas Valley Interurban Railway, Wichita, Kan. This company has also ordered switches and other material for two sidings and five double-end sidings. Paving of its double track right-of-way on Broadway, Gary, Ind., has been started by the Gary Railway, Gary, Ind. Also between 40th and 45th Avenues on Broadway, this company is raising its track to the new surface level and is thermit welding the rails.

Replacement of the present track in Michigan City, Ind., with 130-lb. rail has just been started by the Chicago, South Shore & South Bend Railroad, Michigan City, Ind. Lengths of 66-ft. rail will be set on creosoted ties in concrete for a distance of 2 miles. It is expected that this work will be finished shortly after the first of the year.

### Rail Relaying Completed

The Chicago, South Shore & South Bend Railroad rail relaying program for this fall was completed with the recent installation of 100-lb. rail laid along LaSalle Avenue from College Street to Cummins Siding. The new Buchanan siding using 3,800 ft. of 100-lb. rail has just been completed. Track on the state line curve at Hammond is now being re-layed with Sanborn Sorabatic 100-lb. rail. This stretch of curved track will be reinforced with girder type rail and new protective devices will be installed at the Western Indiana crossing when 2,000 ft. of new track is laid.

Progress on the new interchange with the Monon Railroad, west of Michigan City, which is the company's biggest construction job of the year, has been maintained with approximately 7,000 ft. of track now laid and 60 per cent of the grading completed.

The Memphis Street Railway, Memphis, Tenn., is progressing with its extension on the Jackson Avenue line from Watkins Street to University Boulevard. Work was begun on this project on July 10 and is reported now to be approximately 50 per cent completed. This company is also replacing old T-rails and gravel pavement with 7-in. rail and asphalt paving on Commerce Street between Chelsea Avenue and the city limits. This company has purchased a road oil heating kettle with an attachment for distributing the oil under pressure. The company is doing a large part of the asphalt paving repairs formerly made by the city. Rock asphalt is being used. Fifty 35-ft. tubular steel poles, 50 pieces of 8-in. extra heavy steel pipe and 50 pieces of 6-in. standard steel pipe, 201 Manchester positive plates and 110 positive and negative elements have been ordered by the Chicago Surface Lines. The Arkansas Valley Interurban Railway has ordered 2 miles of 0000 grooved trolley wire.

### Rehabilitation Program

The first step in a rehabilitation program which will provide complete new feeder wire from Gary to Crown Point, Ind., was begun recently by the Gary & Southern Traction Company, a 12-mile interurban line now operated by the Gary Railways. The present work consists of renewing all center poles on 45th Avenue between Broadway and Grant Street and the installation of span construction. Two freight trailer cars have been ordered by the Arkansas Valley Interurban Railway. The Chicago Surface Lines has ordered three dual motor type Twin coaches and the Boston Elevated Railway, Boston, Mass., has ordered six urban 28-ft. Twin coaches.

The Pacific Electric Railway, Los Angeles, Cal., has ordered one 16-passenger Fageol special parlor car type bus. The Washington Railway & Electric Company, Washington, D. C., has received four new type V 29-passenger Yellow coaches. The Community Traction Company, Toledo, Ohio, has ordered twelve buses from the White Motor Company, costing $114,000.

Excavation work for the foundation of a $400,000 addition to the company's power plant has been started by the Columbus, Delaware & Marion Electric Company, Marion, Ohio. This power plant will house two boilers capable of developing 8,000 hp.

## Car and Bus Station for Milwaukee

A sheltered loading station for street cars and motor buses, erected so that all loading and unloading of passengers will be under cover, will be constructed at a cost of $40,000 by the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., at 27th and Hopkins Streets, Milwaukee, Wis. The growing flow of traffic through the intersection is hampered by loading of street cars, and the situation becomes particularly acute during rush hours.

The company has agreed to remove the switching, layover and loading of

its cars entirely from this point. The new station will be on private property of the company, extending from the congested district and located about 100 ft. from the intersection. Double loop tracks will be constructed to accommodate both 12th and 27th Street cars, and a driveway will be provided for buses.

## Improvements in Alliance

To reduce damage claims from grade crossing accidents, the Stark Electric Railroad, Alliance, Ohio, has filed a standing order for one flashing signal to be delivered each month. More than a dozen are to be installed at a cost of $1,000 each.

Work of improving the track between Alliance and Sebring has been started by workmen. New ties are being placed and joints improved. Cost of the improvement is estimated at $8,000.

In the Mount Union district of Alliance workmen are completing a street improvement project estimated at $56,000. The company is placing a new base and installing new track for a distance of nearly ½ mile on this project.

## Paving Brick Association Reports on Highway Conditions

The Engineering Commission appointed by the National Paving Brick Manufacturers Association, Washington, D. C., has made its report on the investigation of paving and general highway conditions. This investigation embraces conferences and correspondence with the United States government, state, city, county, borough and township officials in charge of paving throughout the country, a comprehensive study of technical literature on paving, and a general field inspection of typical paving conditions in the Southern, Middle Atlantic, New England, Eastern and Mid-Western states.

The object of the investigation was to obtain an up-to-date picture of the trend of the highway business in the territory embraced in the survey and also to especially investigate the brick paving situation throughout the country.

The report contains a general discussion of the highway business and the engineering and economic principles that should govern the business. A statement of the standard types of road surfacing and pavements applicable to the different traffic, social, local, climatic and subsoil conditions throughout the country. A general discussion of the brick paving situation, results of special tests and investigations and recommendations relative to method of construction and specifications for brick pavements are also included.

The report places the total highway expenditures at about $2,000,000,000 a year and the waste due to incompetent supervision is estimated to be about $400,000,000 a year. Considerable stress is placed upon the necessity of employing only trained highway engineers to supervise all highway work so that this waste can be eliminated. The statement is made that the paving programs including new construction and reconstruction will grow larger each year in both the centers of population and on rural highways and, due to the constantly increasing traffic, there will be a considerable increase in the higher type construction, particularly on the rural highways.

The report discusses various phases of the highway business, such as lack of understanding of highway problems by public, highway administration, the ultimate highway transportation system, how hard-surfaced roads pay for themselves, through savings in motor vehicle operating costs, planning highway systems, highway transportation investigations, location of highways, savings in motor vehicle transportation costs due to relocations resulting in shortening the distance, by-pass highways, ultimate width of highway rights-of-way, day and night signals, elimination of dangerous conditions, trend in highway construction, standard types of pavements and traffic and maintenance data.

The advantages of vitrified paving brick for street railway tracks and for progressive construction lie in the fact that unit type pavements are unquestionably the most desirable and economical pavements between and adjacent to street railway tracks, and brick pavements are very extensively used under such circumstances. With this type of pavement, repairs can be made to the rails without destroying the paving.

## Weekly Business Conditions

The volume of business during the week ended Nov. 3, as seen from check payments, was somewhat smaller than in the previous week but was larger than a year ago, according to the weekly statement of the Department of Commerce. Activity in steel plants showed expansion, as compared with both the preceding week and the corresponding period of 1927. Prices for iron and steel and copper averaged higher than in either the previous week or the same period a year earlier.

WEEKLY BUSINESS INDICATORS

(Weeks ended Saturday. Average 1923-25 = 100)

| | 1928 | | | | 1927 | | | |
|---|---|---|---|---|---|---|---|---|
| | Nov. 3 | Oct. 27 | Oct. 20 | Oct. 13 | Nov. 5 | Oct. 29 | Oct. 22 | Oct. 15 |
| Steel operations | 114.5 | 113.2 | 115.8 | 115.8 | 86.0 | 86.0 | 84.0 | 87.0 |
| Bituminous-coal production | ..... | 115.4 | 111.1 | 115.7 | 92.6 | 102.8 | 105.5 | 108.3 |
| Lumber production | ..... | 92.3 | 92.3 | 90.9 | 105.5 | 104.5 | 105.5 | 106.4 |
| Petroleum production (daily average) | ..... | ..... | 120.2 | 120.3 | 117.8 | 118.4 | 119.2 | 119.7 |
| Building contracts 37 states (daily average) | 122.4 | 144.9 | 135.7 | 134.3 | 86.3 | 131.8 | 152.0 | 115.1 |
| Price iron and steel composite | 86.3 | 86.1 | 85.9 | 85.6 | 85.8 | 85.8 | 85.9 | 85.9 |
| Copper, electrolytic, price | 113.0 | 110.1 | 108.7 | 108.7 | 94.9 | 94.2 | 93.5 | 94.2 |
| Interest rates, call money | 181.8 | 160.6 | 157.6 | 157.6 | 87.9 | 84.8 | 93.9 | 97.0 |
| Interest rates, time money | 160.0 | 160.0 | 155.3 | 165.7 | 100.0 | 102.9 | 100.0 | 97.1 |
| Federal reserve ratio | 86.7 | 87.7 | 86.8 | 87.2 | 96.0 | 97.2 | 96.9 | 96.8 |

Bond prices averaged higher than in the preceding week but were lower than a year ago. Interest rates for time funds showed no change from the previous week but were higher than last year. Interest rates for call money averaged higher than in either prior period. Stock prices receded from the high level of the preceding week but were still considerably above the level of last year.

The production of bituminous coal during the week ended Oct. 27 showed gains over both the previous week and the same period of last year. Freight car loadings for the latest available week were larger than in the corresponding period of 1927.

## METAL, COAL AND MATERIAL PRICES F. O. B. REFINERY

| | Nov. 7, 1928 |
|---|---|
| **Metals—New York** | |
| Copper electrolytic, cents per lb | 15.775 |
| Copper wire, cents per lb | 17.875 |
| Lead, cents per lb | 6.5 |
| Zinc, cents per lb | 6.60 |
| Tin, Straits, cents per lb | 49.75 |
| **Bituminous Coal, f.o.b. Mines** | |
| Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons | $4.375 |
| Somerset mine run, f.o.b. mines, net tons | 1.875 |
| Pittsburgh mine run, Pittsburgh, net tons | 1.80 |
| Franklin, Ill., screenings, Chicago, net tons | 1.375 |
| Central, Ill., screenings, Chicago, net tons | 0.675 |
| Kansas screenings, Kansas City, net tons | 1.875 |
| **Materials** | |
| Rubber-covered wire, N. Y., No. 14, per 1,000 ft | $5.5 |
| Weatherproof wire base, N.Y., cents per lb. | 18.625 |
| Cement, Chicago net prices, without bags | 2.05 |
| Linseed oil (5-bbl. lots) N. Y., cents per lb. | 10.4 |
| White lead in oil (100-lb. keg), N. Y., cents per lb | 13.25 |
| Turpentine (bbl. lots), N. Y., per gal | $0.60 |

## ADVERTISING LITERATURE

Ohio Brass Company, Mansfield, Ohio, has just published a sixteen-page booklet with complete descriptions and illustrations of the new 250 and 600-volt light-weight portable electric arc welding machines for use on electric railway track circuit bonding and general repair work. The principle of unit construction of the resistance elements in these machines is fully described and brief illustrated reference is made to the various types of rail bonds manufactured by that company.

Sullivan Machinery Company, Chicago, Ill., has issued a new bulletin 76-J describing Sullivan electric portable hoists. This bulletin includes hoists from 10 to 35 hp., in both single and double drum patterns.

General Electric Company, Schenectady, N. Y., has issued bulletins 821A descriptive of pressure and vacuum switches, 71B descriptive of wound-rotor induction motors 900 series, and 81B describing high-torque, double squirrel-cage motors.



# Cleveland's 25 New Articulated Cars–

—just like Cleveland's recent 50 cars, are all equipped, for safety's sake, with Peacock Staffless Brakes.

Powerful and fast in action, yet light in weight; requiring little platform space, and having an unlimited capacity for slack chain; Peacock hand brakes will protect these cars throughout their life, whether it be ten or twenty years or more.

## National Brake Company

890 Ellicott Square Buffalo, N. Y.

*Canadian Representative:* Lyman Tube & Supply Co., Ltd., Montreal, Canada

The Ellcon Co., General Sales Representative, 50 Church St., New York

## Peacock Staffless BRAKES





# 2 LIGHTS IN ONE



A DRIVING RAY



A PASSING RAY

**A FAR-REACHING flood of light when traffic thins and the route is open for faster driving—**

**A soft glareless tilted light of full volume when the road becomes clogged and crowded—**

**Either available instantly with a mere touch of the control switch without removing the hands from the steering wheel—**

**That's Guide Tilt Ray, two lights in one, the modern motor vehicle headlamp!**

**If your vehicles are so equipped, you can be sure that you are contributing substantially to safer and more comfortable night driving. The Guide Motor Lamp Manufacturing Co., Cleveland, Ohio.**

Guide

TILT RAY HEAD LAMPS



*One of the 96 buses of the Teche Transfer Company, Inc., Franklin, La., equipped exclusively with Goodyear Pneumatic Cord Bus Tires*

# "On our entire fleet for the last nine years"

Teche Transfer Company, Inc., of Franklin, La., began operations nine years ago with a few touring cars running between Jeanerette, Franklin and New Iberia, a distance of about 50 miles.

Today, they operate 96 modern, luxurious motor coaches, averaging 10,000 miles a day and carrying about 100,000 passengers a month over routes totaling 1,000 miles, east from New Orleans to the Mississippi Gulf Coast, north through Baton Rouge to Natchez, and west to Lake Charles, through the historical land of Evangeline.

And their tire equipment today as throughout their history is *exclusively* Goodyear Cord Bus Tires.

" " "

"During the nine years we have been operating," writes Mr. F. J. Feight, President, "we have tested out all makes of tires but found Goodyears gave us the best service of all—and for this reason we have used them exclusively on our entire fleet for the last nine years. "Our relations with the local Goodyear Branch have always been very pleasant and the service rendered by The Goodyear Tire & Rubber Co., Inc., has been entirely satisfactory in every way."

The kind of tire performance on which Mr. Feight bases his letter is exemplified in average monthly mileages ranging from 15,000 to 28,000 tire miles—dependably, economically, on Goodyear Cord Bus Tires.

" " "

Goodyear Tires are an important factor in successful motorbus operation.

Their powerfully tractive All-Weather Tread is an insurance of safe, sure, gripping traction on all roads and in all weather.

Their extra-elastic, extra-durable bodies of SUPERTWIST Cord have the strength that means freedom from trouble on the road, the vitality that means low cost per tire mile.

To grow and grow profitably, equip as so many successful companies do, exclusively with Goodyears.

*For every Goodyear Cord Bus Tire there is an equally fine Goodyear Tube, built specially for bus service, and also Goodyear Rubber Tire Chains*

GOODYEAR

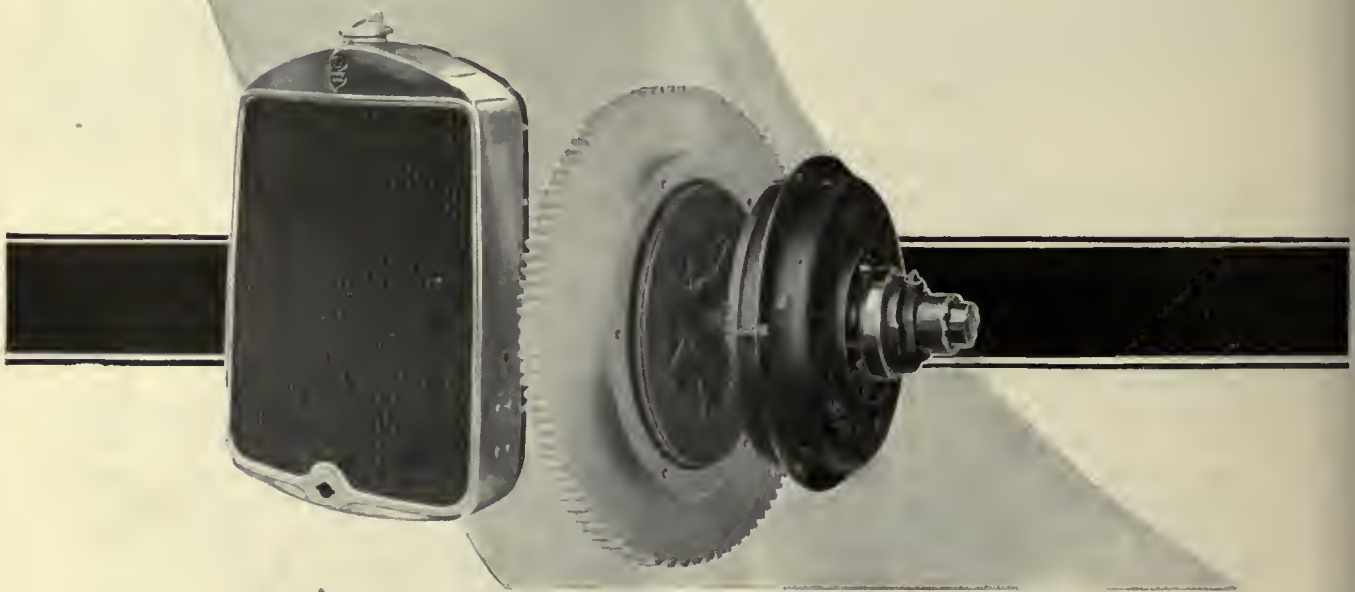
Copyright 1928, by The Goodyear Tire & Rubber Co., Inc.



# DURABILITY

We build durability into each Long Clutch and Radiator. With an unchanging personnel and low labor turnover we can more easily control the manufacture and assembly of the component parts which go into these products.

LONG MANUFACTURING COMPANY
Detroit, Michigan



LONG

LONG PRODUCTS—AUTOMOTIVE CLUTCHES AND RADIATORS


No. 8M5 Special


No. 327-M Special

No. 327-M Special seats are in use by the Virginia Electric and Power Company, which was awarded the Charles A. Coffin medal for 1928.

# DESIGNED FOR INTERURBAN USE

THE 327-M Special is a popular Heywood-Wakefield electric railway seat. The deep, double spring construction of the cushion and the restful pitch of the spring-filled backs make this attractive style one of the most comfortable interurban seats ever offered.

The 8M5 Special is a de luxe interurban type with spring-filled seats and backs. It has been purposely designed and built to withstand the most severe use and abuse, while delivering trouble-proof service year after year.

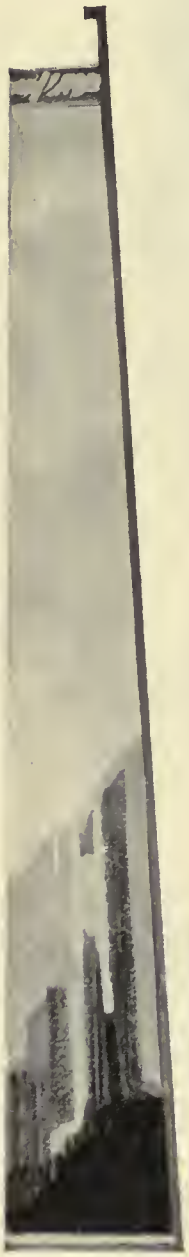
Our car seating experts will be glad to assist in solving your equipment problems. This service is yours without cost or obligation. Just write to the nearest Heywood-Wakefield sales office.

## HEYWOOD-WAKEFIELD COMPANY

Boston, Massachusetts

516 West 34th St., New York City
439 Railway Exchange Bldg., Chicago, Ill.
J. R. Hayward, Liberty Trust Bldg., Roanoke, Va.
A. W. Arlin, Delta Bldg., Los Angeles, Calif.
H. G. Cook, Hobart Bldg., San Francisco, Calif.
The G. F. Cotter Supply Co., Houston, Texas
The Railway and Power Engineering Corporation
133 Eastern Ave., Toronto; Montreal; Winnipeg, Canada

# *This Message was Approved*



IN the November 24th issue of The Saturday Evening Post will appear the first of a series of Union Metal advertisements dealing with "public relations." The question very naturally arises, "Why should you as a manufacturer interest yourself in the public relations angle of the electrical industry?"

The answer is this. Union Metal Fluted Steel Transmission and Distribution Poles are far more than just another type of steel pole. In utility and appearance they outstrip anything which has yet been placed on the market.

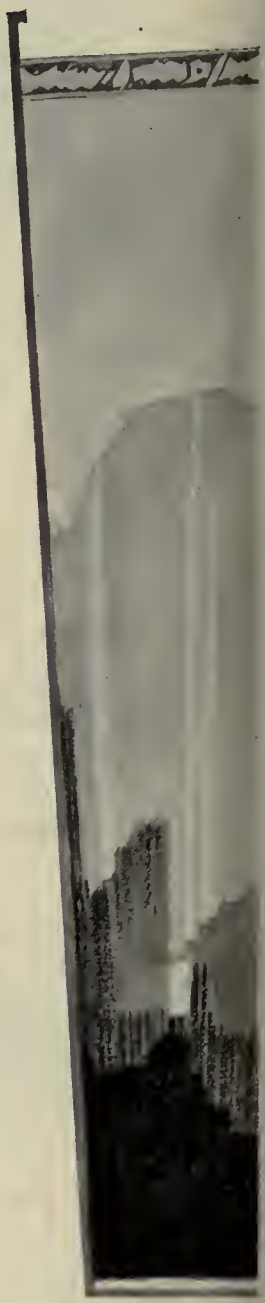
And this appearance factor is of real importance. There is no doubt that the public is "pole sick." The underground wire agitation is a direct result of this condition.

But give the public a good looking pole and you have silenced this agitation and won friends for your company. After all, is that not the essence of public relations efforts?

This advertisement was submitted to a considerable number of men in the electrical industry before it was published. 99% of these men said in effect: "That's good. Go ahead."

—And so we are going ahead in our small way to help the public to a greater appreciation of the problems confronting the electrical industry. It is our wish that this will not only help conserve the investment which you now have, but will assist you in combating movements which would force unwarranted additional investments.

Our engineers are at your service at any time. If a situation arises where we can be of service, just let us know. You will find that Union Metal co-operation is the real thing.



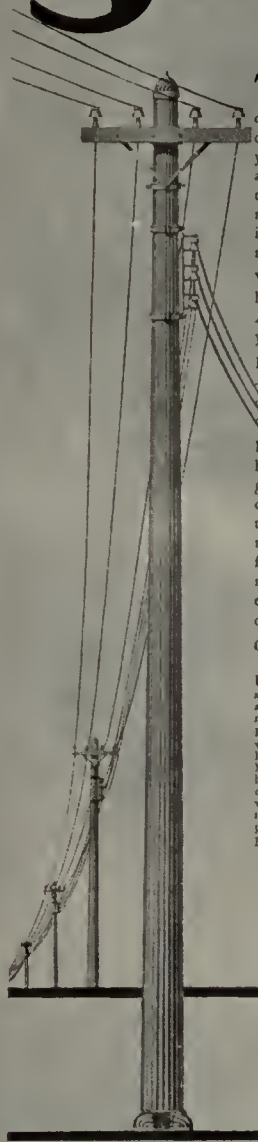
THE UNION METAL MANUFACTURING CO.
*General Offices and Factory:* Canton, Ohio
*Branches:* New York, Chicago, Philadelphia, Detroit, Cleveland, Pittsburgh, St. Louis, Los Angeles, San Francisco, Jacksonville.

# UNION METAL DISTRIBUTION AND

# by the Electrical Industry

THE SATURDAY EVENING POST
November 24, 1928

# 3 wires
## and all they mean to YOU



THREE small, black wires run from a nearby pole to your home Unconsciously, each hour, each day, they enter into your life, bringing additional comforts and greater freedom. Early in the morning your electric percolater and toaster aid in the preparation of breakfast Later, the vacuum cleaner helps tidy up the house. The electric heater warms the room for baby's bath. The electric washer and ironer, in turn, take up their tasks. The electric refrigerator maintains its constant vigil.

When night falls, clean cheerful illumination turns home into the most enjoyable spot in the world And if you wish, the mere turn of a knob brings to you the finest of radio programs.

From these three wires spring heat, cold, light, music —in addition to greater freedom from household duties—and all for a few cents a day. Where else can you obtain so much for so little?

But behind this miracle of low cost electricity—behind those three wires—stand miles of "feeders," great sub-stations, giant generating equipment, all costing millions of dollars. On this invested capital, the public utilities are entitled to receive a fair return. Obviously, any movement which would force these companies to invest additional millions must be promptly reflected in the cost of your electricity unless such an investment produces operating economies or a greater sale of power.

Consequently, whenever anyone agitates for underground wires, you as a consumer must in the long run foot the bill; for the underground wires are very expensive to install, but work no operating economies or produce no greater sale of power.

If it were essential to place wires underground in order to realize the "City Beautiful" ambition, the expense would perhaps be justified in certain extreme cases. But if you carefully analyze the objection to overhead wires, you will find that the wires themselves do not offend your sense of beauty, but the poles on which they have been placed.

In line with the "City Beautiful" movement, Union Metal has now developed a heavy duty FLUTED STEEL pole of such beauty that the public immediately accepts it as the logical means of supporting wires where artistic ends are to be served. These poles are low in cost and exceptionally durable.

Already such cities as Cleveland, Detroit, Wheeling, Pontiac and others have accepted Union Metal Heavy Duty Fluted Steel Poles as the logical means of obtaining streets of beauty without burdening the public utilities and, in turn, the citizenship, with the expense of costlier equipment. If you wish further information on these new poles, consult your local power company. Their engineers are well equipped to give you full details.

THE UNION METAL MANUFACTURING CO.
*General Offices and Factory,* Canton, Ohio
Branches: New York, Chicago, Philadelphia, Detroit, Cleveland, Pittsburgh, St. Louis, Los Angeles, San Francisco, Jacksonville.

UNION METAL Heavy Duty Fluted Steel Poles are patterned after the beautiful columns of ancient Greece and Rome, but pressed from modern, enduring steel.

Embodied in these poles are new principles which make them lighter, stronger, and longer lived than any pole as yet produced. Union Metal Poles provide greater strength and flexibility in all directions and have a lower center of gravity Moreover, because of their exclusive ventilated construction and cadmium coating, the hazard of ground line corrosion has been practically eliminated.

Briefly, the advantages of Union Metal Poles are:
(1) Fewer poles are required.
(2) Better appearance is obtained.
(3) Longer pole life is assured.

UNION METAL
FLUTED STEEL PRODUCTS



# UNION METAL
## DISTRIBUTION AND TRANSMISSION POLES

# TRANSMISSION POLES

"CAR CARD ADVERTISING
ALMOST EVERYWHERE"



ELECTRIC railway executives have been solving transportation problems and meeting the needs of the people every day, summer and winter, rain and shine, for many decades. No other group is so eminently qualified to economically render proper mass transportation.

The ability to maintain any service as a real asset can only be proven by a long period of successful operation.

BARRON G. COLLIER
INCORPORATED

NEW · YORK · CITY




Cars of the Indiana Service Corporation are upholstered with luxurious VELMO

CHASE Velmo

GENUINE MOHAIR PLUSH AT ITS BEST

SEAT coverings of Velmo Mohair on railroads have demonstrated beyond doubt that this regal "travel fabric" can afford service up to 20 years—standing the necessary renovating as only a good quality mohair plush can. Velmo invites and holds patronage. Samples on request.

Made by SANFORD MILLS, SANFORD, ME.
Selling Agents: L. C. Chase & Co., Boston, New York, Detroit, San Francisco, Chicago

# Reduces car stripping hours—costs—labor

THE next time cars go into the paint shop, try Oakite materials for stripping before priming and repainting. The satisfying results and surprising economies will convince you that Oakite cleaning methods deserve a steady job in your shops.

Oakite stripping loosens paint quickly— gets down to the body metal without tedious scrubbing and scraping; leaves the clean, smooth surface essential for a satisfactory paint job. And a smaller amount of Oakite material does the work faster, in a more thoroughgoing fashion.

Call in your nearest Service Man. He will be glad to tell you about dollar-saving Oakite methods for speeding up repainting. Write or phone and he will call. No obligation, of course.

*Oakite Service Men, cleaning specialists, are located in the leading industrial centers of the U. S. and Canada*

Manufactured only by
OAKITE PRODUCTS, INC., 28B Thames St., NEW YORK, N. Y.

**OAKITE**
TRADE MARK REG U.S. PAT. OFF.
*Industrial Cleaning Materials and Methods*



# COLUMBIA

## Railway and Utility Supplies

Castings—Grey Iron, Brass and Aluminum

Forgings
Special Machinery and Patterns

Machine and Sheet Metal Work

Armature and Field Coils.

*The* Columbia Machine Works *and M. I. Co.*
265 Chestnut St., corner Atlantic Ave.,
Brooklyn, New York



*All the essential data on all phases of electric railway practice*

Electric railway executives, engineers, and operating men have long respected Richey's ELECTRIC RAILWAY HANDBOOK as the one great pocketbook of practice data, formulas and tables in the electric railway field. It covers every phase of electric railway work from Roadbed and Track to Signals and Communication.

*Richey's*
**Electric Railway Handbook**

Second Edition

*798 pages, pocket-size, flexible, illustrated. $4.00 postpaid.*

It presents

(1) Data on subects which come up in everyday electric railway practice for constant use by the operating, constructing and designing engineer.

(2) Material of service to the non-technical manager or operator.

(3) Reference material on electric railway practice for those who are specializing in other or allied fields.

Information every electric railway man needs — best methods —changes in practice and theory —that's Richey.




*See it FREE*

McGRAW-HILL FREE EXAMINATION COUPON

McGraw-Hill Book Co., Inc., 370 Seventh Ave., New York, N. Y.

You may send me on 10 days' approval RICHEY'S ELECTRIC RAILWAY HANDBOOK, $4.00 net. I agree to pay for the book or return it postpaid within 10 days of receipt.

Signed .....
Address .....
Official Position .....
Name of Company .....

E.11-10-28



**Surplus Stocks Are Easily Disposed of** *Through the*

# "SEARCHLIGHT SECTION"

"FOR SALE" announcements are carefully read by the trade.

"SEARCHLIGHT" Ads bring prompt and profitable returns.

***Displayed—$5.00 or less an inch per insertion.***

0143





# *Unfamiliar Languages*

## BUT *One Familiar Word:—*

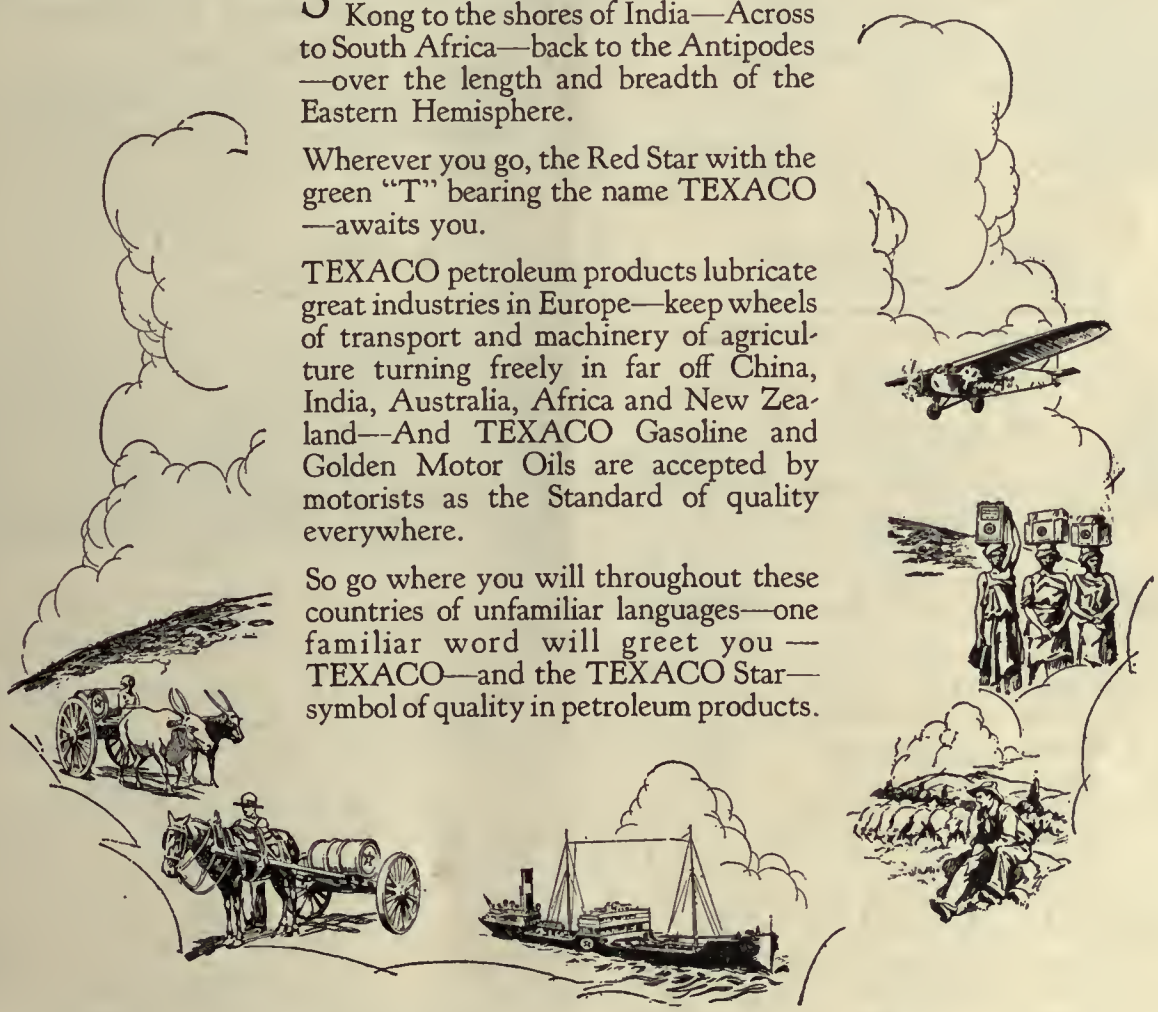
# TEXACO

SAIL down the China Sea from Hong Kong to the shores of India—Across to South Africa—back to the Antipodes —over the length and breadth of the Eastern Hemisphere.

Wherever you go, the Red Star with the green "T" bearing the name TEXACO —awaits you.

TEXACO petroleum products lubricate great industries in Europe—keep wheels of transport and machinery of agriculture turning freely in far off China, India, Australia, Africa and New Zealand—And TEXACO Gasoline and Golden Motor Oils are accepted by motorists as the Standard of quality everywhere.

So go where you will throughout these countries of unfamiliar languages—one familiar word will greet you — TEXACO—and the TEXACO Star—symbol of quality in petroleum products.



*There is a TEXACO Lubricant for every Purpose*

THE TEXAS COMPANY

*Texaco Petroleum Products*

Dept. EN, 17 Battery Place, New York City

OFFICES IN PRINCIPAL CITIES

# Bankers and Engineers


**Ford, Bacon & Davis**
Incorporated
**Engineers**
39 Broadway, New York
PHILADELPHIA CHICAGO SAN FRANCISCO

**The J. G. White Engineering Corporation**
Engineers — Constructors
Steam and Hydro-Electric Power Plants, Gas Plants, Steam and Electric Railroads, Transmission Systems, Buildings and Industrial Plants.
43 Exchange Place New York

**STONE & WEBSTER**
Incorporated
Design and Construction
Examinations Reports Appraisals
Industrial and Public Service Properties
NEW YORK BOSTON CHICAGO

**THE BEELER ORGANIZATION**
Transportation, Traffic, Operating Surveys
Better Service—Financial Reports
Appraisals—Management
52 Vanderbilt Ave. New York

**SANDERSON & PORTER**
ENGINEERS
PUBLIC UTILITIES & INDUSTRIALS
Design Construction Management
Examinations Reports Valuations
CHICAGO NEW YORK SAN FRANCISCO

**ENGELHARDT W. HOLST**
*Consulting Engineers*
Appraisals Reports Rates Service Investigation
Studies on Financial and Physical Rehabilitation
Reorganization Operation Management
683 Atlantic Ave., BOSTON, MASS.

**ALBERT S. RICHEY**
ELECTRIC RAILWAY ENGINEER
WORCESTER, MASSACHUSETTS
REPORTS - APPRAISALS - RATES - OPERATION - SERVICE

**STEVENS & WOOD**
Incorporated
*Engineers and Constructors*
20 Pine Street, New York
*Transportation Examinations and Reports*

C. B. BUCHANAN, President — W. H. PRICE, JR., Sec'y-Treas. — JOHN F. LAYNG, Vice-President
**BUCHANAN & LAYNG CORPORATION**
*Engineering and Management, Construction*
*Financial Reports, Traffic Surveys*
*and Equipment Maintenance*
BALTIMORE: 1004 Citizens National Bank Bldg. — Phone: Hanover: 2142 — NEW YORK: 49 Wall Street

**WALTER JACKSON**
*Consultant on* Fares and Motor Buses
The Weekly and Sunday Pass—Differential Fares—Ride Selling
Holbrook Hall 5-W-3
160 Gramatan Ave., Mt. Vernon, N. Y.

**HEMPHILL & WELLS**
CONSULTING ENGINEERS
Gardner F. Wells Albert W. Hemphill
*APPRAISALS*
INVESTIGATIONS COVERING
Reorganization Management Operation Construction
50 East 42nd St., New York City

**McCLELLAN & JUNKERSFELD**
Incorporated
ENGINEERING AND CONSTRUCTION
Examinations—Reports—Valuations
Transportation Problems—Power Developments
68 TRINITY PLACE NEW YORK

**KELKER, DeLEUW & CO.**
CONSULTING ENGINEERS
REPORTS ON
Operating Problems Valuations Traffic Surveys
111 W. Washington Street, Chicago, Ill.

**BYLLESBY**
ENGINEERING AND MANAGEMENT CORPORATION
231 S. La Salle Street, Chicago
New York Pittsburgh San Francisco

**E. H. FAILE & CO.**
*Designers of*
Garages— Service Buildings— Terminals
441 LEXINGTON AVE. NEW YORK

**SCARR TRANSPORTATION SERVICE, INC.**
*Railway and Highway Consulting Engineers*
An organization of experienced engineers, prepared to assist you in the installation of highway operations as a substitute for or a supplement to your rail operations.
225 BROADWAY, NEW YORK

**THE P. EDWARD WISH SERVICE**

50 Church St. NEW YORK — *Street Railway Inspection* DETECTIVES — 131 State St. BOSTON

When writing the advertiser for information or prices, a mention of the Electric Railway Journal would be appreciated.

**NACHOD & UNITED STATES SIGNAL CO., INC.**

LOUISVILLE, KY.

BLOCK SIGNALS FOR ELECTRIC RAILWAYS

HIGHWAY CROSSING SIGNALS



**Arc Weld Rail Bonds**

AND ALL OTHER TYPES

*Descriptive Catalogue Furnished*

**American Steel & Wire Company**

CHICAGO, NEW YORK, BOSTON, CLEVELAND, WORCESTER, PHILADELPHIA, PITTSBURGH, BUFFALO, DETROIT, CINCINNATI, BALTIMORE, WILKES-BARRE, ST. LOUIS, KANSAS CITY, ST. PAUL, OKLAHOMA CITY, BIRMINGHAM, MEMPHIS, DALLAS, ATLANTA, DENVER, SALT LAKE CITY

EXPORT REPRESENTATIVE: U. S. STEEL PRODUCTS CO., NEW YORK. PACIFIC COAST REPRESENTATIVE: U. S. STEEL PRODUCTS COMPANY, SAN FRANCISCO, LOS ANGELES, PORTLAND, SEATTLE.

**Hale and Kilburn SEATS**

Better Quality Seats For Cars and Buses

Hale & Kilburn Co.
1800 Lehigh Ave., Philadelphia, Pa.

**Kalamazoo Trolley Wheels**

The value of Kalamazoo Trolley Wheels and Harps has been demonstrated by large and small electric railway systems for a period of thirty years. Being exclusive manufacturers, with no other lines to maintain, it is through the high quality of our product that we merit the large patronage we now enjoy. With the assurance that you pay no premium for quality we will appreciate your inquiries.



THE STAR BRASS WORKS
KALAMAZOO, MICH., U. S. A.

**RAILWAY UTILITY COMPANY**

CAR COMFORT WITH UTILITY

HEATERS
REGULATORS
VENTILATORS

2241-2247 Indiana St. Chicago, Ill.

*Write for Catalogue*

1328 Broadway New York, N. Y.

**Ramapo Ajax Corporation**

EIGHT WORKS
RAMAPO-AJAX-ELLIOT
HILLBURN, NEW YORK
NIAGARA FALLS, N.Y.
CHICAGO, ILLINOIS
EAST ST. LOUIS, ILL.
PUEBLO, COLORADO
SUPERIOR, WISCONSIN
LOS ANGELES, CAL.
NIAGARA FALLS, ONT. CANADA



RACOR

RAMAPO AUTOMATIC RETURN SWITCH STANDS AND RACOR DASH POTS FOR PASSING SIDINGS

MANGANESE WORK A SPECIALTY

*Sales Office 30 Church St. New York*
*Also at all works*



**Johnson Electric Fare Boxes**



and overhead registers make possible the instantaneous registering and counting of every fare. Revenues are increased 1½ to 5% and the efficiency of one-man operation is materially increased. Over 5000 already in use.

**Johnson Fare Box Co.**
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ELECTRIC HEATERS WITH OPEN COIL OR ENCLOSED ELEMENTS
THERMOSTAT CONTROL—VENTILATORS
WRITE FOR NEW CATALOGUE

Advertisements for the
**Searchlight Section**



Can be received at the New York Office of Electric Railway Journal until 10 a. m.

**Wednesday**

For issue out Saturday

0220



**Boyerized Parts:**

Brake Pins
Brake Hangers
Brake Levers
Pedestal Gibs
Brake Fulcrums
Turnbuckles
Case Hardened Bushings
Center Bearings
Side Bearings
Spring Post Bushings
Spring Posts
Bolster and Transom Chafing Plates
Manganese Brake Heads
Manganese Truck Parts
Forgings
Bronze Bearings
McArthur Turnbuckles
Trolley Pins

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54 First Street, Portland, Oregon.

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A. W. Arlin,
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Bemis Car Truck Company
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## *The* DIFFERENTIAL CAR



*Standard on 60 Railways for*

Track Maintenance
Track Construction
Ash Disposal
Coal Hauling
Concrete Materials
Waste Handling
Excavated Materials
Hauling Cross Ties
Snow Disposal

*Use These Labor Savers*

Differential Crane Car
Clark Concrete Breaker
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Differential Car Wheel Truck and Tractor

THE DIFFERENTIAL STEEL CAR CO., Findlay, O.

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Hegeman-Castle Corporation, Railway Exchange Building, Chicago, Ill.
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Lister-Reese Inc., 401 S. Brand Blvd., Glendale, Calif.

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National Hand Holds
Genesco Paint Oils
Dunham Hopper Door Device
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Walter Tractor Snow Fighters
Feasible Drop Brake Staffs
Ft. Pitt Spring & Mfg. Co., Springs
Bell Register Fare Boxes
Fraser Gas Electric Drive
Flaxlinum Insulation
Economy Electric Devices Co. Power Saving and Inspection Meters
National Safety Devices Company's Whistle Blowers, Gong Ringers and Brake Hangers
Godward Gas Generators
Cowdrey Automotive Brake Testing Machine
Tru-Drum Lathe

## Lorain Special Trackwork Girder Rails

*Electrically Welded Joints*

THE LORAIN STEEL COMPANY
Johnstown, Pa.

*Sales Offices:*

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Philadelphia Pittsburgh Dallas

*Pacific Coast Representative:*
United States Steel Products Company
Los Angeles Portland San Francisco Seattle

*Export Representative:*
United States Steel Products Company, New York, N. Y.

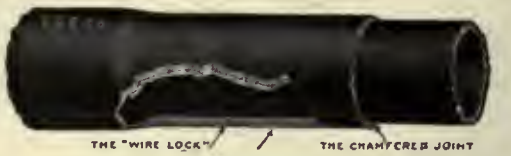
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gives three times the service of hard drawn copper. Standard with leading railways.

*Write for Phono Book—full of useful facts.*

BRIDGEPORT BRASS CO.
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COMBINE

Lowest Cost Lightest Weight
Least Maintenance Greatest Adaptability

Catalog complete with engineering data sent on request.

ELECTRIC RAILWAY EQUIPMENT CO.
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THE WORLD'S STANDARD

## "IRVINGTON"

Black Varnished Silk, and Yellow Varnished Cambric, Yellow Varnished Paper

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Irvington Varnish & Insulator Co.
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## *Tisco Manganese Steel* Special Trackwork

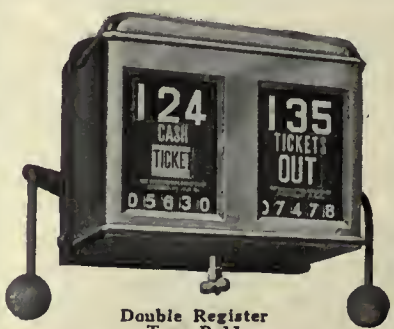
*For*

Subway, Elevated and Surface Lines

WM. WHARTON JR. & CO., Inc.
*EASTON, PA.*

SALES OFFICES

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Philadelphia Pittsburgh San Francisco Scranton




Double Register
Type R-11

## International Registers

Made in single and double types to meet requirements of service. For hand or foot, mechanical or electric operation. Counters, car fittings, conductors' punches.

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# SEARCHLIGHT SECTION

## USED EQUIPMENT & NEW—BUSINESS OPPORTUNITIES

UNDISPLAYED—RATE PER WORD:

*Positions Wanted*, 4 cents a word, minimum 75 cents an insertion, payable in advance.

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INFORMATION:

*Box Numbers* in care of any of our offices count 10 words additional in undisplayed ads.

*Discount* of 10% if one payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

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*An advertising inch* is measured vertically on one column, 3 columns—30 inches—to a page.

R.J.

## WANTED

**WANTED**

**5 Second Hand Birney Cars**

In good operating condition. Trucks Brill 79-E, Westinghouse 508-A Motors, K-63 Br. Controllers, General Electric C. P. 25 Air Equipment.

**SIOUX CITY SERVICE COMPANY,**
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**POSITION VACANT**

COMPETENT man wanted, familiar with up-to-date store keeping methods to take complete charge stores department large public utility South America. Must be thoroughly experienced, good organizer with sound knowledge material and equipment. Knowledge Portuguese or Spanish desirable, but not essential; give full details education, experience and references. PW-145, Electric Railway Journal, Tenth Ave. at 36th St., New York.

**POSITION WANTED**

ENGINEER—Twenty years' experience with large Eastern road as roadmaster, division superintendent M. of W. and division manager. Qualified by experience for engineer M. of W. or manage a property operating cars and buses. PW-143, Electric Railway Journal, Tenth Ave. at 36th St., New York.

FOR SALE CHEAP

**Winner Reversible Car Seats**

Rattan Covered as follows: 22 complete seats, backs and cushions; 4 extra seat backs; 4 extra seat cushions. Write

**Philadelphia & Western Railway Company**
P. O. Box 118, Norristown, Pa.

**TO HELP YOU**

GET WHATEVER YOU NEED

**"Searchlight" Advertising**



**STREET RAILWAY EQUIPMENT**

*Bought and Sold*

*Highest Prices for entire Railways and Power Plants*

**H. E. SALZBERG COMPANY, Inc.**

225 Broadway, New York City



# Saving is a good habit, BUT—

# Why Save Things You'll Never Use?

WHY let Mother Nature grow grass between the wheels of replaced cars? Why pile up rails, shop equipment, power plant equipment, line equipment, car appliances, road building material, etc., etc., you will never use again?

TODAY you can turn them over at a fair price. Tomorrow they will be—JUNK. Is it not the better part of good horse-sense to dispose of them NOW?

6000 other electric railway men will see your advertisements of used or surplus equipment and materials here—in the Searchlight Section of their business paper.

Some of these men—officials or executives of other lines in other parts of the country and operating under different conditions—can use what you no longer need. For an insignificant investment you can tell these others what you have. And they will buy.

One "Searchlight" advertiser wrote, "We can cheerfully recommend the Searchlight Section as a wonderful medium for reaching buyers of rails and equipment." Another—"The strongest proof that your 'Searchlight' finds its way to many readers is shown by the numerous letters we have received in answer to our recent ad."

Let us tell you the cost of advertising your used or surplus equipment and materials in the Searchlight Section. Just address a list of what you have to dispose of to the

Searchlight Department

ELECTRIC RAILWAY JOURNAL

Tenth Ave. at 36th St., New York, N. Y.

# WHAT AND WHERE TO BUY

**Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors Advertising in this Issue**

This index is published as a convenience to the reader. Every care is taken to make it accurate, but *Electric Railway Journal* assumes no responsibility for errors or omissions.

**Advertising, Street Car**
Collier, Inc., Barron G.

**Air Brakes**
General Electric Co.
Westinghouse Tr. Br. Co.

**Anchors, Guy**
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

**Armature Shop Tools**
Columbia Machine Works
Elec. Service Supplies Co.

**Automatic Return Switch Stands**
Ramapo Ajax Corp.

**Automatic Safety Switch Stands**
Ramapo Ajax Corp.

**Axles**
Bemis Car Truck Co.
Bethlehem Steel Co.
Brill Co., The J. G.
Cincinnati Car Co.
Westinghouse E. & M. Co.

**Axles (Front & Rear) Motor Truck & Passenger Car**
Timken-Detroit Axle Co.

**Axles, Trailer & Motor Bus**
Timken-Detroit Axle Co.

**Babbitting Devices**
Columbia Machine Works

**Badges and Buttons**
Elec. Service Supplies Co.
International Reg. Co., The

**Batteries, Dry**
Nichols-Lintern Co.

**Batteries, Storage**
Electric Storage Battery Co.

**Bearings and Bearing Metals**
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works
Westinghouse E. & M. Co.

**Bearings, Anti-Friction**
Timken Roller Bearing Co.

**Bearings, Center and Roller Side**
Cincinnati Car Co.
Columbia Machine Works
Stucki Co., A.

**Bearings, Roller**
Timken Roller Bearing Co.

**Bearings, Thrust**
Timken Roller Bearing Co.

**Bells and Buzzers**
Consolidated Car Htg. Co.

**Bells and Gongs**
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works
Elec. Service Supplies Co.

**Benders, Rail**
Railway Trackwork Co.

**Bodies, Bus**
Brill Co. The J. G.

**Bolts, Case Hardened**
American Steel Foundries
Bemis Car Truck Co.

**Bond Testers**
American Steel & Wire Co.
Electric Service Supplies Co.

**Bonding Apparatus**
American Steel & Wire Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.

**Bonds, Rail**
American Steel & Wire Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.
Westinghouse E. & M. Co.

**Books**
McGraw-Hill Book Co.

**Brackets and Cross Arms (See also Poles, Ties, Posts, etc.)**
Columbia Machine Works
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.

**Brake Adjusters**
American Steel Foundries
Brill Co., The J. G.
Cincinnati Car Co.
National Ry. Appliance Co.
Westinghouse Tr. Br. Co.

**Brake Shoes**
Bemis Car Truck Co.
Brill Co., The J. G.

**Brake Testers**
National Ry. Appliance Co

**Brakes, Brake Systems and Brake Parts**
American Steel Foundries
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works
General Electric Co.
National Brake Co.
Westinghouse Tr. Br. Co.

**Brakes, Magnetic Rail**
Cincinnati Car Co.

**Brushes, Carbon**
General Electric Co.
Westinghouse E. & M. Co.

**Brushholders**
Columbia Machine Works
General Electric Co.

**Buses, Motor**
General Electric Co.

**Bus Lighting**
National Ry. Appliance Co.

**Bushings, Case Hardened and Manganese**
American Steel Foundries
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works

**Cables (See Wires and Cables)**

**Cambric Tapes, Yellow and Black Varnish**
General Electric Co.
Irvington Varn'h & Ins. Co.

**Carbon Brushes (See Brushes, Carbon)**

**Car Lighting Fixtures**
Elec. Service Supplies Co.

**Car Panel Safety Switches**
Consolidated Car Htg. Co.
Westinghouse E. & M. Co.

**Car Steps, Safety**
Cincinnati Car Co.

**Car Wheels, Rolled Steel**
Bethlehem Steel Co.

**Cars, Dump**
Brill Co., The J. G.
Differential Steel Car Co.

**Cars, Gas-Electric**
Brill Co., The J. G.
General Electric Co.
Westinghouse E. & M. Co.

**Cars, Gas, Rail**
Brill Co., The J. G.

**Cars, Passenger, Freight, Express, etc.**
American Car Co.
Brill Co., The J. G.
Cincinnati Car Co.
Kuhlman Car Co., G. C.
Wason Mfg. Co.

**Cars, Self-Propelled**
Brill Co., The J. G.

**Castings, Brass Composition or Copper**
Cincinnati Car Co.
Columbia Machine Works

**Castings, Gray Iron and Steel**
American Steel Foundries
Bemis Car Truck Co.
Columbia Machine Works
Standard Steel Works

**Castings, Malleable & Brass**
Bemis Car Truck Co.
Columbia Machine Works
Timken Roller Bearing Co.

**Catchers and Retrievers, Trolley**
Elec. Service Supplies Co.
Ohio Brass Co.

**Chairs, Parlor Car**
Heywood-Wakefield Co.

**Change Carriers**
Cleveland Fare Box Co.
Electric Service Supplies Co.

**Change Trays**
Cincinnati Car Co.

**Circuit-Breakers**
General Electric Co.
Westinghouse E. & M. Co.

**Clamps and Connectors for Wires and Cables**
Columbia Machine Works
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

**Cleaners**
Oakite Prod., Inc.

**Cleaners and Scrapers, Track (See also Snow-Plows, Sweepers and Brooms)**
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Cincinnati Car Co.

**Clutches**
Long Mfg. Co.

**Coil Banding and Winding Machines**
Columbia Machine Works
Elec. Service Supplies Co.
Westinghouse E. & M. Co.

**Coils, Armature and Field**
Columbia Machine Works
General Electric Co.
Westinghouse E. & M. Co.

**Coils, Coke and Kicking**
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.

**Coin Changers**
Johnson Fare Box Co.

**Coin Counting Machines**
Cleveland Fare Box Co.
International Reg. Co., The
Johnson Fare Box Co.

**Coin Sorting Machines**
Cleveland Fare Box Co.
Johnson Fare Box Co.

**Coin Wrappers**
Cleveland Fare Box Co.

**Commutator Slotters**
Columbia Machine Works
Elec. Service Supplies Co.
Westinghouse E. & M. Co.

**Commutators or Parts**
Columbia Machine Works
General Electric Co.
Westinghouse E. & M. Co.

**Compressors, Air**
General Electric Co.
Westinghouse Tr. Br. Co.

**Condensers**
General Electric Co.
Westinghouse E. & M. Co.

**Condenser Papers**
Irvington Varn'h & Ins. Co.

**Connectors, Solderless**
Westinghouse E. & M. Co.

**Connectors, Trailer Car**
Columbia Machine Works
Consolidated Car Htg. Co.
Elec. Service Supplies Co.
Ohio Brass Co.

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Columbia Machine Works
General Electric Co.
Westinghouse E. & M. Co.

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Elec. Service Supplies Co.

**Controlling Systems**
General Electric Co.
Westinghouse E. & M. Co.

**Converters, Rotary**
General Electric Co.
Westinghouse E. & M. Co.

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American Brass Co.
Anaconda Copper Mining Co.

**Copper Wire Instruments, Measuring, Testing and Recording**
American Brass Co.
Anaconda Copper Mining Co.

**Cord, Bell, Trolley, Register**
American Steel & Wire Co.
Brill Co., The J. G.
Elec. Service Supplies Co.
International Reg. Co., The
Roebling's Sons Co., John A.

**Cord Connectors and Couplers**
Elec. Service Supplies Co.

**Couplers Car**
American Steel Foundries
Brill Co., The J. G.
Cincinnati Car Co.
Ohio Brass Co.
Westinghouse Tr. Br. Co.

**Cowl Ventilators**
Nichols-Lintern Co.

**Cranes, Hoists & Lifts**
Electric Service Supplies Co

**Cross Arms (See Brackets)**

**Crossing Foundations**
International Steel Tie Co.

**Crossings**
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

**Crossings, Frogs & Switches**
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

**Crossings, Manganese**
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

**Crossings, Track (See Track Special Work)**

**Crossings, Trolley**
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

**Curtains & Curtain Fixtures**
Brill Co., The J. G.

**Cutting Apparatus**
General Electric Co.
Railway Trackwork Co.
Una Welding & Bonding Co.
Westinghouse Tr. Br. Co.

**Dealer's Machinery & Second Hand Equipment**
Salzberg Co., Inc., H. E.

**Derailing Devices (See also Track Work)**

**Derailing Switches**
Ramapo Ajax Corp.

**Destination Signs**
Columbia Machine Works
Elec. Service Supplies Co.

**Detective Service**
Wish-Service, P. Edward

**Door Operating Devices**
Brill Co., The J. G.
Cincinnati Car Co.
Consolidated Car Heating Co.
National Pneumatic Co.

**Doors, Folding Vestibule**
National Pneumatic Co.

**Doors & Door Fixtures**
Brill Co., The J. G.
Cincinnati Car Co.
Hale-Kilburn Co.

**Drills, Track**
American Steel & Wire Co.
Electric Service Supplies Co.
Ohio Brass Co.

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Nat'l Rlwy. Appliance Co.

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Electric Service Supplies Co.
Westinghouse E. & M. Co.

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Columbia Machine Works
Electric Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

**Electric Grinders**
Railway Trackwork Co.

**Electrical Wires and Cables**
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**Electrodes, Carbon**
Railway Trackwork Co.
Una Welding & Bonding Co.

**Electrodes, Steel**
Railway Trackwork Co.
Una Welding & Bonding Co.

**Engineers, Consulting, Contracting and Operating**
Beeler, John A.
Buchanan & Layng Corp.
Byllesby Co., H. M.
Faile & Co., E. H.
Ford, Bacon & Davis
Hemphill & Wells
Holst, Engelhardt W.
Jackson, Walter
Kelker & DeLeuw
McClellan & Junkerfeld
Richey, Albert S.
Sanderson & Porter
Scarr Transport Service, Inc.
Stevens & Wood
Stone & Webster Co.
White Eng. Corp., The J. G.

**Engines, Gas, Oil or Steam**
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Johnson Fare Box Co.
Money Meters, Inc.
Nat'l Rlwy. Appliance Co.
Perey Mfg. Co.

**Fare Registers**
Electric Service Supplies Co.
Johnson Fare Box Co.
Money Meters, Inc.

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American Steel & Wire Co.

**Fenders and Wheel Guards**
Brill Co., The J. G.
Cincinnati Car Co.
Star Brass Works

**Fibre and Fibre Tubing**
Westinghouse E. & M. Co.

**Field Coils (See Coils)**

**Floodlights**
Electric Service Supplies Co.
General Electric Co.

**Forgings**
American Steel Foundries
Brill Co., The J. G.
Cincinnati Car Co.
Standard Steel Works Co.

**Frogs & Crossings, Tee Rail**
Bethlehem Steel Co.
Lorain Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

**Frogs, Track (See Track Work)**

**Frogs, Trolley**
Electric Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

**Fuses and Fuse Boxes**
Columbia Machine Works
Consolidated Car Htg. Co.
General Electric Co.
Westinghouse E. & M. Co.

**Gasoline**
Texas Co., The

Continued on page 36

# Isn't the real question: *"How much per mile?"*



*Bethlehem Forged Steel Axles match Bethlehem Rolled Steel Wheels in strength and wearing qualities. They can be furnished rough-turned all over or finished, and untreated, annealed or heat treated.*

The purchase of car wheels is really the purchase of so much mileage. That means that, considering merely the original cost, no wheel is of itself an expensive one, no wheel an economical one. It all depends on the *cost per mile!*

On a cost-per-mile basis—the only true basis of comparison—many railway executives have found that Bethlehem Rolled Steel Wheels are the most economical wheels that can be used. Their life in service is very long. And, cars equipped with Bethlehem Wheels keep moving and earning revenue. They do not have to be frequently laid up while broken, cracked, or flat wheels are being replaced.

Safety and long life are worked into Bethlehem Rolled Steel Wheels in the making. Five distinct forging and rolling operations are necessary to produce a Bethlehem Wheel. Forging gives the metal toughness and density; rolling improves the grain structure throughout the entire wheel, tending to prevent crystallization in the flange and tread, and virtually eliminating the possibility of breakage.

There are easier, less expensive methods of manufacturing wheels. But the care that goes into the making of Bethlehem Wheels is more than justified by the long, trouble-free service that they give, and by their low cost per mile.

BETHLEHEM STEEL COMPANY
*General Offices*: Bethlehem, Pa.

*District Offices*: New York, Boston, Philadelphia, Baltimore, Washington, Atlanta, Pittsburgh, Buffalo, Cleveland, Detroit, Cincinnati, Chicago, St. Louis, San Francisco, Los Angeles, Seattle, Portland and Honolulu.

*Bethlehem Steel Export Corporation, New York*
*Sole Exporter of Our Commercial Products*

**BETHLEHEM**
*Rolled Steel*
**WHEELS**

**Gas Electric Drive for Buses**
General Electric Co.
Nat'l Rlwy. Appliance Co.

**Gas Producers**
Westinghouse E. & M. Co.

**Gates, Car**
Brill Co. The J. G.
Cincinnati Car Co.

**Gear Blanks**
Brill Co., The J. G.
Standard Steel Works Co.

**Gear Cases**
Columbia Machine Works
Electric Service Supplies Co.
Westinghouse E. & M. Co.

**Gears and Pinions**
Bemis Car Truck Co.
Columbia Machine Works
Electric Service Supplies Co.
General Electric Co.
Nat'l Ry. Appliance Co.
Nuttall & Co., R. D.
Westinghouse-Nuttall

**Generators**
General Electric Co.
Westinghouse E. & M. Co.

**Girder Rails**
Bethlehem Steel Co.
Lorain Steel Co.

**Gongs (See Bells and Gongs)**

**Grease**
Texas Co., The

**Grinders, Portable**
Railway Trackwork Co.

**Grinders, Portable Electric**
Railway Trackwork Co.

**Grinding Bricks and Wheels**
Railway Trackwork Co.

**Guard Rail Clamps**
Lorain Steel Co.
Ramapo Ajax Corp.

**Guard Rails, Tee Rail & Manganese**
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

**Guards, Trolley**
Elec. Service Supplies Co.
Ohio Brass Co.

**Harps, Trolley**
Columbia Machine Works
Elec. Service Supplies Co.
Nuttall & Co., R. D.
Ohio Brass Co.
Star Brass Works
Westinghouse-Nuttall

**Headlights**
Elec. Service Supplies Co.
General Electric Co.
Guide Motor Lamp Mfg. Co.
Ohio Brass Co.

**Headlining**
Columbia Machine Works

**Heaters, Car (Electric)**
Consolidated Car Heating Co.
Gold Car Heat. & Ltg. Co.
Railway Utility Co.
Smith Heater Co., Peter

**Heaters, Car, Hot Air and Water**
Smith Heater Co., Peter

**Heaters, Car Stove**
Smith Heater Co., Peter

**Helmets, Welding**
Railway Trackwork Co.
Una Welding & Bonding Co.

**Hoists & Lifts**
Columbia Machine Works

**Hoists, Portable**
Sullivan Machinery Co.

**Hose, Bridges**
Ohio Brass Co.

**Hose, Pneumatic**
Westinghouse Tr. Brake Co.

**Instruments, Measuring, Testing and Recording**
American Steel & Wire Co.
General Electric Co.
National Ry. Appliance Co.
Westinghouse E. & M. Co.

**Insulating Cloth, Paper and Tape**
General Electric Co.
Irvington Varn'h & Ins. Co.
Okonite Co.
Okonite-Callender Cable Co.
Westinghouse E. & M. Co.

**Insulating Silk**
Irvington Varn'h & Ins. Co.

**Insulating Varnishes**
Irvington Varnish & Ins. Co.

**Insulation (See also Paints)**
Electric Ry. Equipment Co.
Elec. Service Supplies Co.
Irvington Varn'h & Ins. Co.
Okonite Co.
Okonite-Callender Cable Co.
Westinghouse E. & M. Co.

**Insulation Slots**
Irvington Varn'h & Ins. Co.

**Insulator Pins**
Elec. Service Supplies Co.
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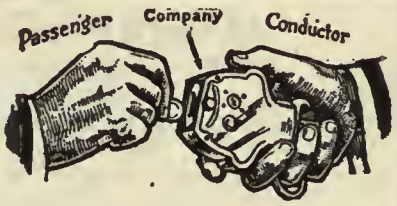
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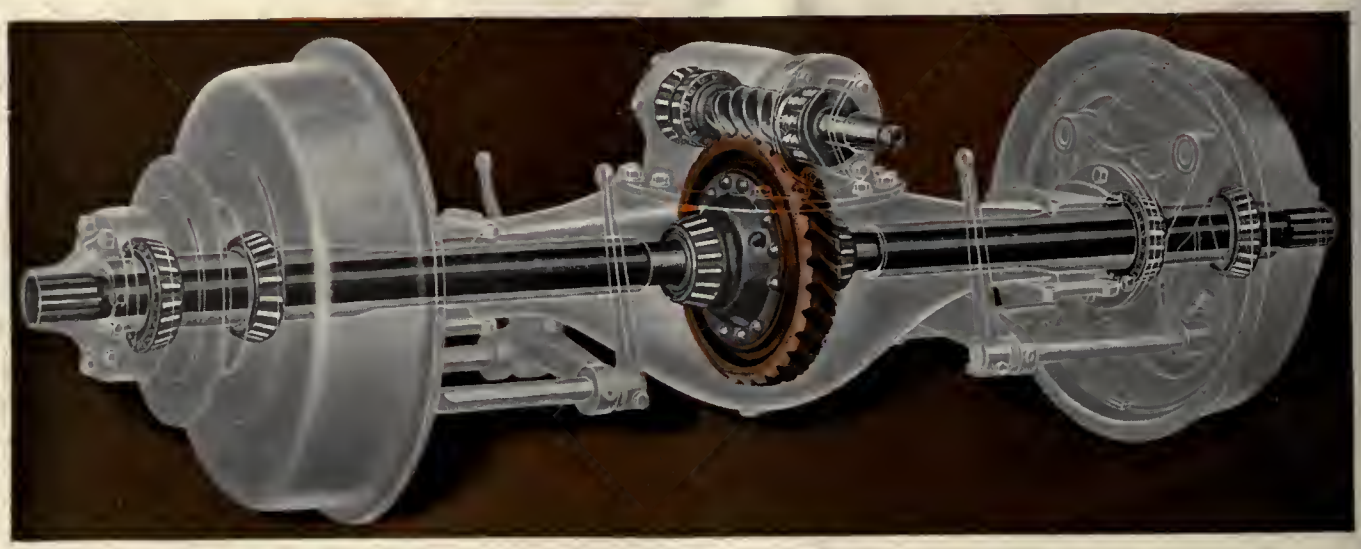
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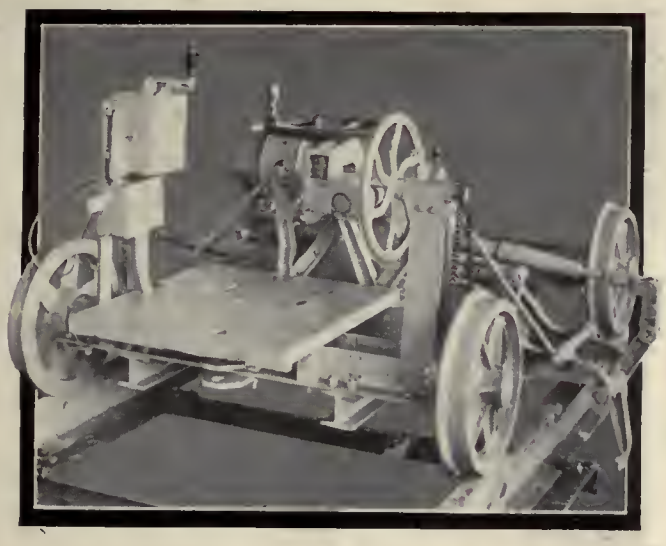
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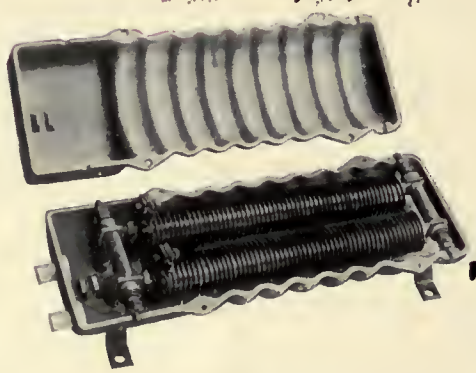
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Ten type M Heater Units.

One type TK-452-A Change-over Switch.

One type 371-C-22 Ground Relay.

THE average city car, operating on 500 volts and making seven stops per mile, has starting resistor losses of from 400 to 500 watthours per car mile. Assuming that your car runs 35,000 miles per year and that heat is required on 200 days, the new Westinghouse Type M car heater will utilize enough of the ordinarily dissipated power to return 15 per cent on the investment after all fixed charges, maintenance and depreciation have been paid.

Ask the Westinghouse Salesman.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania

Sales Offices in all Principal Cities of the United States and Foreign Countries

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MEMBER ELECTRIC MANUFACTURERS ASSOCIATION AERA 1928

# Westinghouse

# Electric Railway Journal

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1928

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November 17, 1928

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BETTER RAIL, BETTER TRANSPORTATION

# Why They'll Buy—

New cars on rough track are no better than a good auto on a rutty, bumpy highway.

Travellers will avoid both. They'll buy street car transportation—on good track.

*Complete details on the complete line —get them*

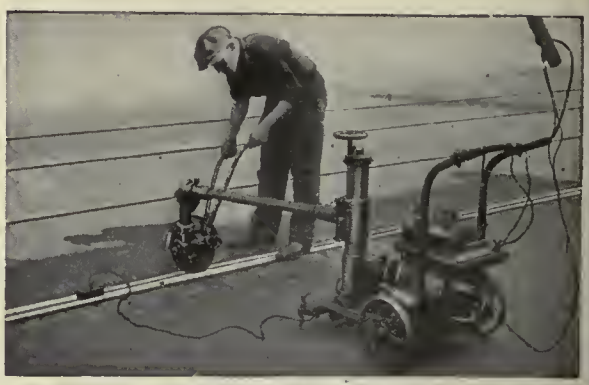
**Railway Track-work Co.**

3132-48 East Thompson Street, Philadelphia

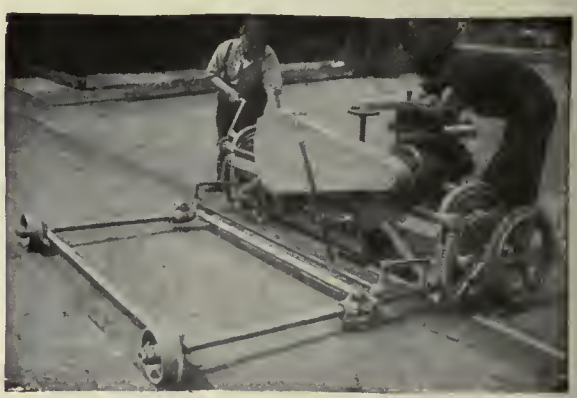
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Chas. N. Wood Co., Boston
Electrical Engineering & Mfg. Co., Pittsburgh
H. F. McDermott, 208 S. LaSalle St., Chicago
P. W. Wood Railway Supply Co., New Orleans, La.
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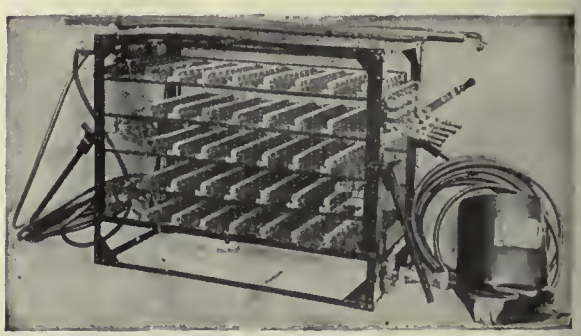
Eureka Radial Rail Grinder



Vulcan Rail Grinder



Reciprocating Track Grinder



"Ajax" Electric Arc Welder

BETTER RAIL, BETTER TRANSPORTATION

# DOLLARS AND SENSE




Savings in operating expense and saving your patron's good will—especially on a zero winter morning—go hand in hand. Overhead maintained and serviced by the best quality materials costs less in upkeep and goes a long way toward maintaining schedules. Thus net profits benefit.

# O-B TROLLEY SPLICERS

## Maintain Schedules When Wire Troubles Double!

WINTER weather is the overhead man's bugaboo—the days that mean more breaks, interrupted schedules, irritated patrons and heavy calls on the service crews. Records show that cold, sleet and snow practically double trolley wire breakage.

Yet, the promptness with which an O-B Splicer makes a *permanent* repair greatly minimizes the difficulties.

Ease of installation is important, but smooth approach and leave are equally valuable. The elimination of excessive wear on trolley wheels, coupled with holding strength greater than the strength of the wire, make O-B Splicers most desirable—in fact, very necessary in the winter months.

Full particulars of the popular Type C Splicer, as well as other O-B designs, will be found on pages 541 to 549 of O-B Catalog No. 20.



### Brass With a Purpose!

WITH copper and lead and zinc anyone can make brass—but for what? The combinations are infinite, as are the uses for the metal. But no group of bright inspired minds starting from scratch will ever be able to replace the years of patient study and research, and the accumulation of brass facts which goes into each O-B product, each best suited to its particular purpose in life.

**Ohio Brass Company, Mansfield, Ohio**
Canadian Ohio Brass Co., Limited
Niagara Falls, Canada
955L

# Ohio Brass Co.

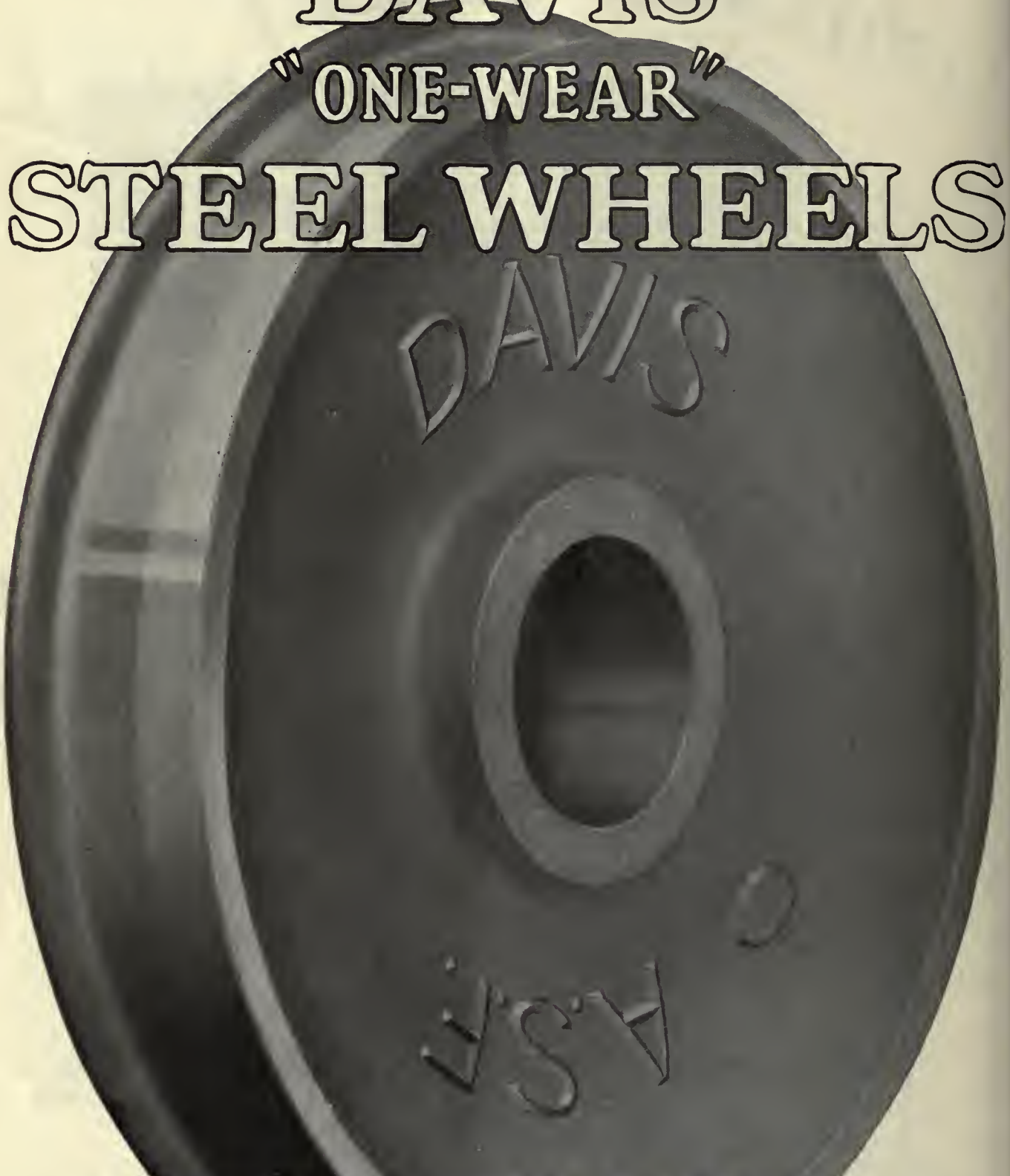
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PORCELAIN INSULATORS
LINE MATERIALS
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CAR EQUIPMENT
MINING MATERIALS
VALVES

# DAVIS

## "ONE-WEAR"

# STEEL WHEELS




## AMERICAN STEEL FOUNDRIES

NEW YORK CHICAGO ST. LOUIS

# 3 Positive Answers to the Armature Handling Problem

The Peerless Type B Armature stand—two rugged steel adjustable supports with heavy circular bases. Adjustable for height while armature is in position. A table is attached which is convenient for tools when winding and as a seat when putting the leads in the commutator.

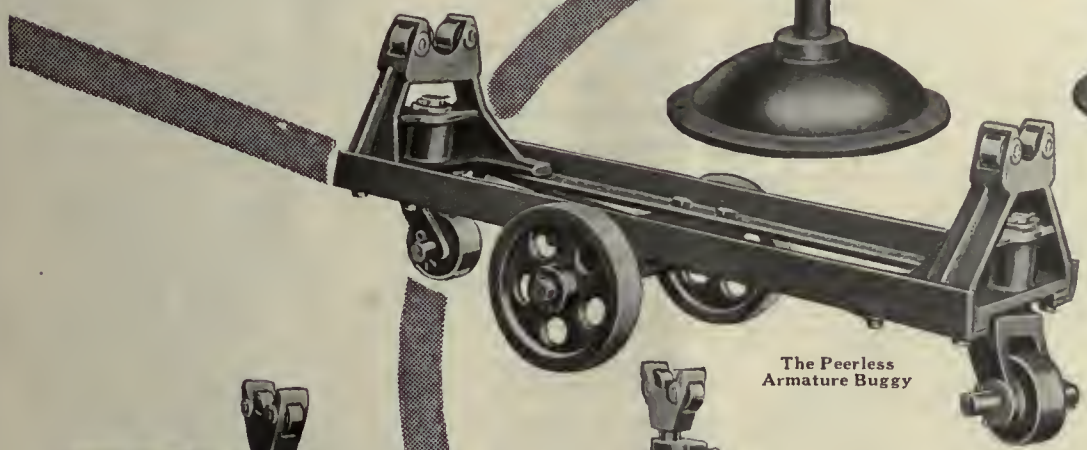
The Peerless Armature Buggy—a strong, compact metal truck on easy-guiding pivoted castors, designed for quick, easy handling of armatures around the shops and in the hauls to the bake oven. Two 1¼ inch bronze rollers protect the armature shaft against damage.

Peerless Type A armature winding stands consist of two cast iron standards mounted on angle steel sills, one standard permanently attached to the sill, the other being adjustable to various lengths of armatures. Substantial construction, hinged shelves at each end for tools or as seats for operator, easy guiding rollers make the Peerless Type A a labor-saver around the shop.

Get more details on this money saving equipment.



Type B Armature Stand



The Peerless Armature Buggy



Type A Armature Winding Stand

Home office and plant at 17th & Cambria Sts., PHILADELPHIA: District Offices at 111 N. Canal St., CHICAGO; 50 Church St., NEW YORK; Bessemer Bldg., Pittsburgh; 88 Broad St., Boston; General Motors Bldg., Detroit; 316 N. Washington Ave., Scranton; Canadian Agents, Lyman Tube & Supply Company, Ltd., Montreal, Toronto, Vancouver.

# ELECTRIC SERVICE SUPPLIES CO.

MANUFACTURER OF RAILWAY, POWER AND INDUSTRIAL ELECTRICAL MATERIAL

# At 5 o'clock

## *All Paths Lead to the Electric Railway*

. . . Five o'clock and millions of workers "call it a day." From factory, mill and office they come, each intent on getting home—and all depending on the electric railway to get them there.

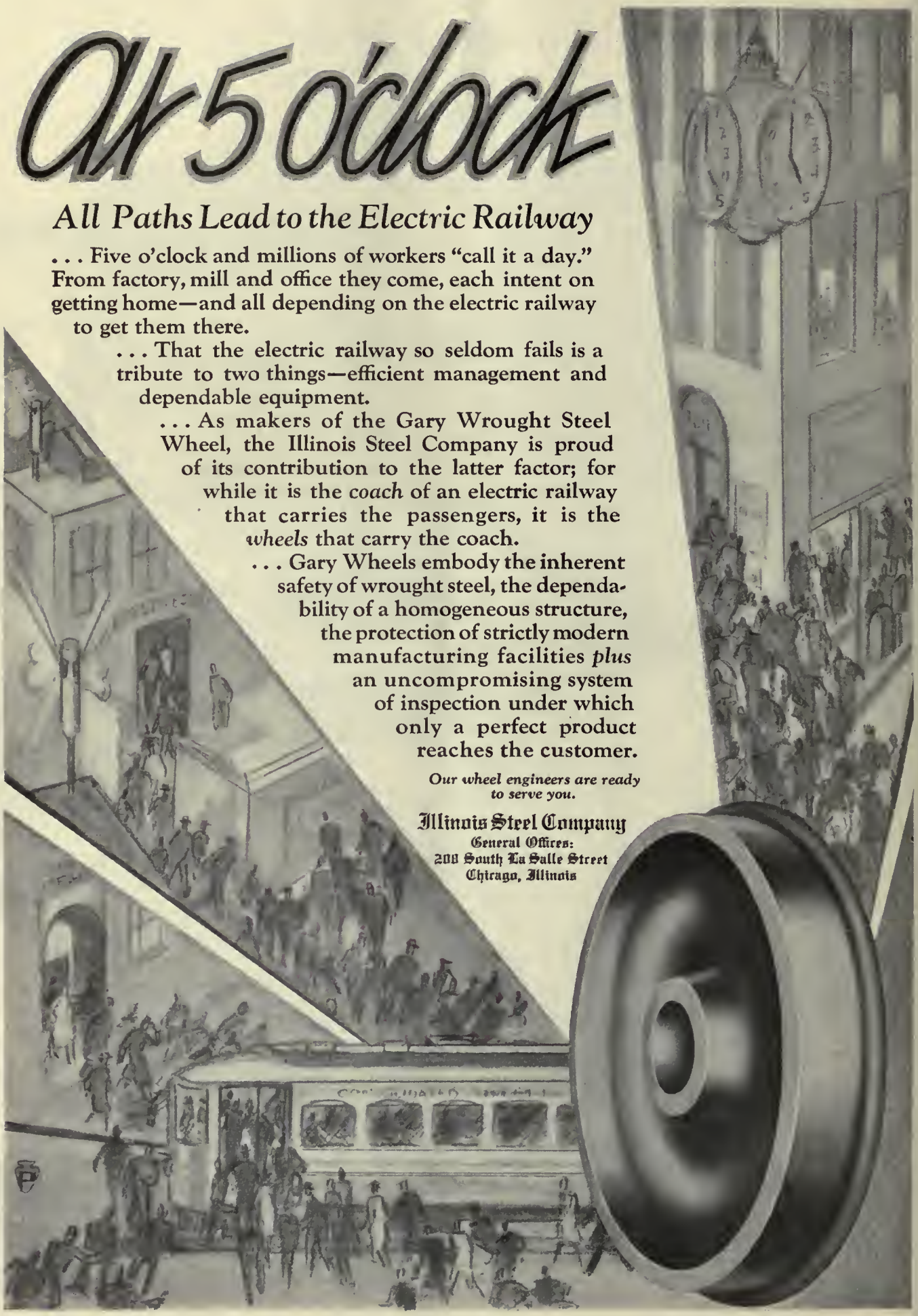
. . . That the electric railway so seldom fails is a tribute to two things—efficient management and dependable equipment.

. . . As makers of the Gary Wrought Steel Wheel, the Illinois Steel Company is proud of its contribution to the latter factor; for while it is the *coach* of an electric railway that carries the passengers, it is the *wheels* that carry the coach.

. . . Gary Wheels embody the inherent safety of wrought steel, the dependability of a homogeneous structure, the protection of strictly modern manufacturing facilities *plus* an uncompromising system of inspection under which only a perfect product reaches the customer.

*Our wheel engineers are ready to serve you.*

**Illinois Steel Company**
General Offices:
208 South La Salle Street
Chicago, Illinois



MERCURY-ARC

POWER RECTIFIERS



*1000 kw. A-B-B Mercury-Arc Power Rectifier at Floral Park Substation of the Long Island R.R., which feeds direct current at 650 volts to the third rail of the company's lines under semi-automatic control.*

# A-B-B Traction Substation *on the* LONG ISLAND RAILROAD

MORNING and evening rush hours on the Long Island Railroad bring the sharp load peaks that characterize metropolitan commutation service.

The A-B-B Mercury-Arc Power Rectifier installed at Floral Park daily carries its share of the traction load of this system.

This newer method of converting a.c. to d.c. is now employed in A-B-B equipped stations on many traction systems all over the country. Higher efficiencies attend the use of A-B-B rectifiers.

The exact margin saved depends on the load characteristics of the system.

Any of our representatives in 37 principal cities will be glad to arrange inspection trips to the nearest A-B-B installation.

AMERICAN BROWN BOVERI ELECTRIC CORPORATION

Offices in 37 principal cities — Main Plant, Camden, N. J.

Steam Turbo-Generator Sets
Mercury-Arc Power Rectifiers
Transformers
High Voltage Oil Circuit Breakers
Synchronizers

Automatic Voltage Regulators
Electric Locomotives
Turbo-Compressors and Blowers
Complete Substation equipment
Car Lighting Equipment

Multiple Unit Car equipment
Subway Traction equipment
Diesel-Electric Locomotives
Scavenging and Supercharging Blowers
Turbo-Boosters and Exhausters

**AMERICAN BROWN BOVERI**

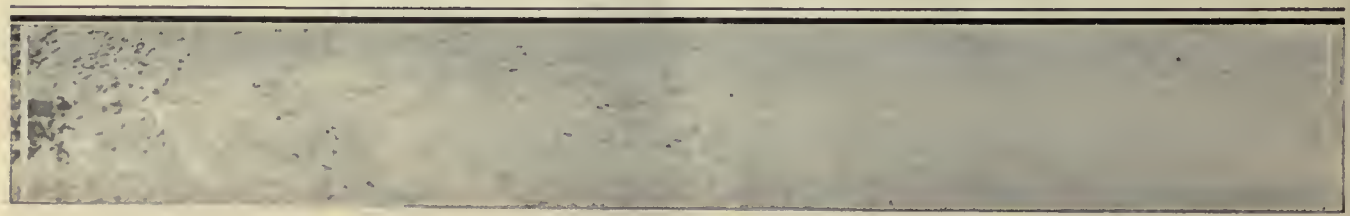


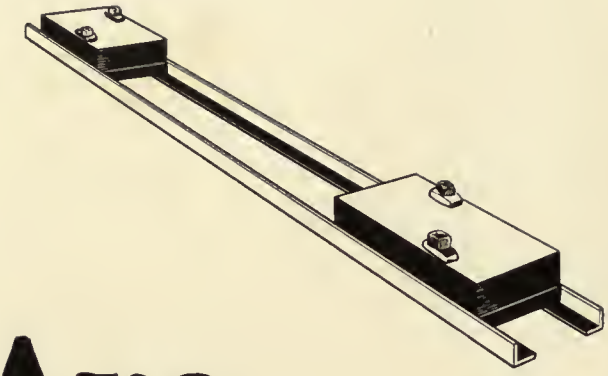
# Quicker—Safer!

Westinghouse Air Brakes have given a decided impetus to highway transportation. They assure maximum safety and utility of heavy buses and trucks. Adequate control without driver fatigue safeguards operation under all conditions . . . in congested traffic . . . in quick overload runs . . . in strenuous city service. The modern vehicle is thus made truly modern.

WESTINGHOUSE TRACTION BRAKE CO.
Wilmerding
Penn.

WESTINGHOUSE
AUTOMOTIVE AIR BRAKES

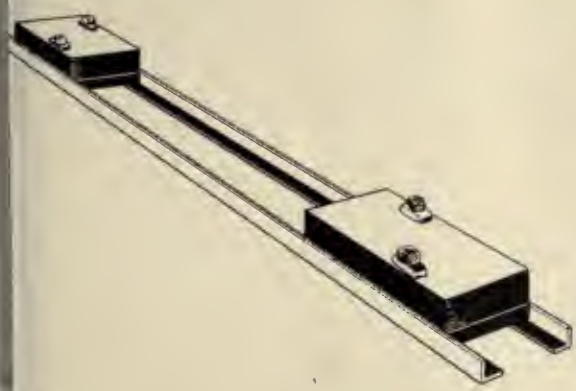




# You Are Building for Permanence

# Are You Getting It

# ?



# You Build Track For Permanence—

## *Are You Getting It?*

You build track for permanence—for minimum cost of maintenance—

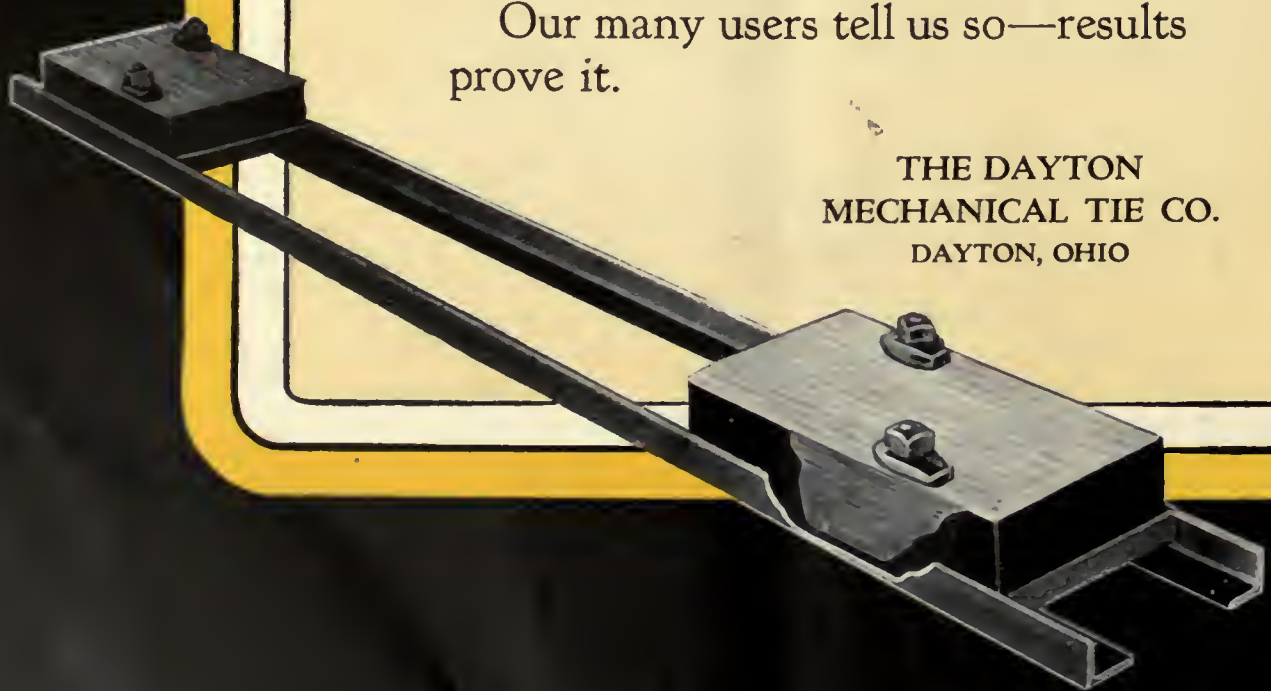
You build to reinforce and preserve the easy riding qualities of your modern cars.

This is your purpose—but are you getting permanence.

If you use Dayton Ties, you are assured of the last word in permanence. They contribute every element for long useful life with negligible maintenance.

Our many users tell us so—results prove it.

THE DAYTON
MECHANICAL TIE CO.
DAYTON, OHIO





# TREADLE-IZATION!
## MORE REVENUE

Treadle-ization increases earnings not only because it increases schedule speed and reduces unproductive standing time, but because it extends the scope of one-man operation and adds to the comfort and safety of the passenger.

NP

NATIONAL PNEUMATIC COMPANY

*Executive Office:* Graybar Building, New York

*General Works,* Rahway, New Jersey

CHICAGO
518 McCormick Building

MANUFACTURED IN TORONTO, CANADA, BY
Railway & Power Engineering Corp., Ltd.

PHILADELPHIA
1010 Colonial Trust Building

## Lays Rails for Double Track at Night

**Without any delay to traffic Birmingham Electric Company completes 900 ft. of track reconstruction in eleven days**

RECONSTRUCTION and repairs of track should be done with the least possible inconvenience to the public, in the opinion of the Birmingham Electric Company, Birmingham, Ala. Not only is it the opinion of the company, but it is an ideal that has been practiced by the company consistently. There is no need to expatiate

# *In Birmingham, Ala.*



laid on creosoted ties in concrete, with bolted and bonded joints. The paving was of creosoted wooden blocks. The new construction consists of A.E.R.E.A. 7-in., 122-lb. girder rail, on the same ties with brick paving. It was necessary to use a 2-in. cast-iron tie plate on each tie to raise the 7-in. rail up to the grade of the former 9-in. rail. All joints were thermit welded.

In the work of reconstru[illegible] the wooden blo[illegible]

# "ALL JOINTS were THERMIT WELDED"

**Rails the length of a city block, installed without interrupting traffic! Thermit welds made this job possible! The rails were welded at the side of the road by day, and thrown into place at night.**

**And the traffic procession will continue to move without interference by joint repair work because Thermit welds eliminate the joints.**

**Many roads are now using Thermit as extensively for repairing old joints, as for new construction.**

THERMIT

**METAL & THERMIT CORPORATION**

120 BROADWAY, NEW YORK, N.Y.

PITTSBURGH CHICAGO BOSTON SOUTH SAN FRANCISCO TORONTO

# Keep Pace With Those Who Set It . . . .



LOOK into the street—there's your competition—flashing by on rubber tires.

How many people are driving downtown in their automobiles to work, because the street cars are too slow, too uncomfortable, too out-of-date, too *everything?*

How many of those automobile drivers boast that they've not *had* to ride in a street car for months?

A lot of them!

To change the picture, you've got to have Cincinnati Modern Light Weight Cars on your lines. Cincinnati Cars bring back the errant rider, build new business—increase profits. Cincinnati Cars are light, graceful, smooth running, appealing—they accelerate and decelerate in a minimum of time. And the Cincinnati Duplex Air-Magnetic Brake makes them the safest cars obtainable.



CINCINNATI CAR COMPANY
CINCINNATI, OHIO

CINCINNATI BALANCED LIGHTWEIGHT CARS



*International Poles stacked on creosoted skids at the Beaumont Plant. Note their uniformity in size and stacking—poles in foreground being framed, also on creosoted skids.*

# AN OFFICIAL RECORD

THE Forest Service of the U. S. Department of Agriculture report of poles treated during 1927 reads as follows:

> **"In 1927 a total of 3,637,989 poles were subjected to preservation treatment. This constitutes an increase of 824,859 over the 2,813,130 that were given treatment in 1926. Southern Pine Poles stood at the head of the list in point of number treated, with a total of 1,738,839 or nearly half the total quantity reported."**

Of the total increase in the number of poles treated shown above, namely, 824,859 — 812,910 were yellow pine — a gain of 88% over the number reported treated in 1926.

The increase in the use of creosoted pine poles has been brought about by reason of the growing recognition on the part of engineers and pole using companies of the following advantages of Creosoted Pine Poles:

***Superior Strength***
***Longer Life***
***Fire Resistant***
***Freedom From Failures***
***Lower Annual Cost***

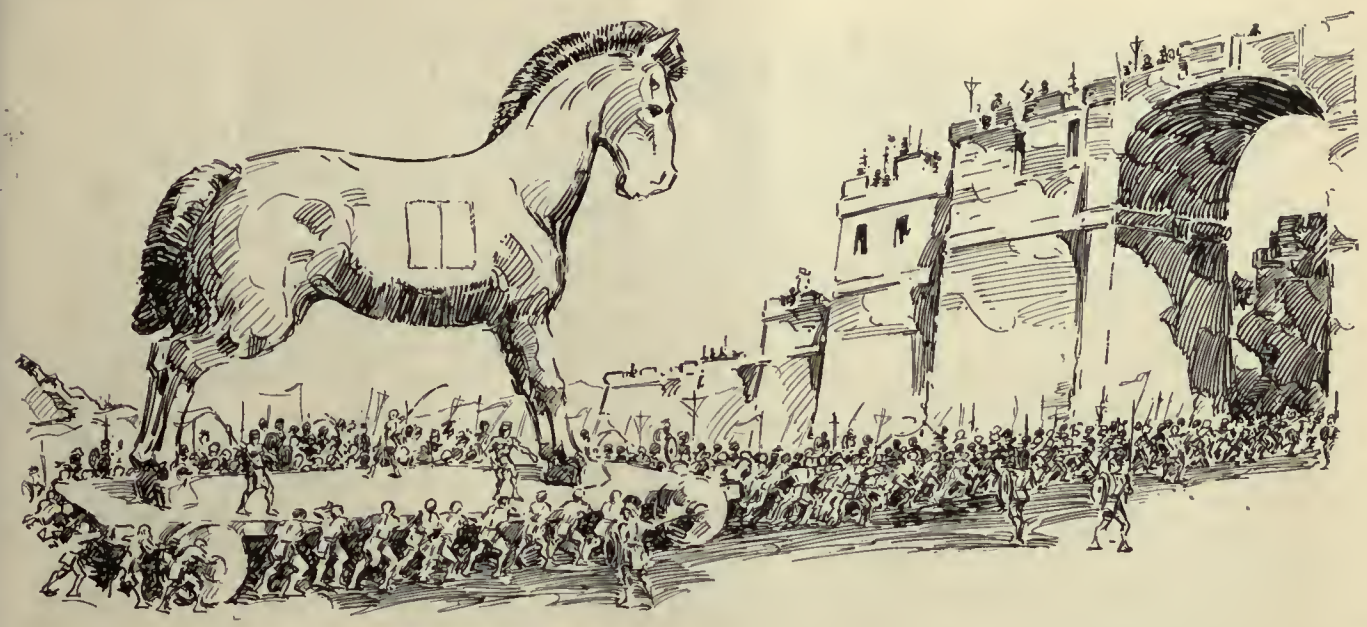
The ***International Creosoting and Construction Company*** with fifty years of experience in the treatment of yellow pine, has for years and is today specializing in the production, seasoning and treatment of pine poles along strictly scientific lines. The proof lies in the facts. ***International*** has thousands of poles in service 20—25 and 30 years which are still in an excellent state of preservation.

A large stock of poles is always available from which quick shipment can be made. Fill your requirements from this quality stock.

**International Creosoting and Construction Co.**
**General Office: Galveston, Texas**
**Plants: Texarkana—Beaumont—Galveston**

# International
## Creosoted Yellow Pine Poles

Distributed by GraybaR Electric Company



# . . . . and at TROY

When the gates of ancient Troy swung open to permit the entrance of the famous Wooden Horse, it marked the first instance in history of successful door operation on a large scale.

For years the Greeks had besieged the walled city without avail until Ulysses, by a simple trick unlocked the gates that led to the fulfillment of the invaders' mission.

Those city gates of ancient Troy may not have a modern counterpart, but the principle of effective door operation is still important today . . . especially in the electric railway field.

For many years the Consolidated Car-Heating Company has been manufacturing door operating equipment that is known throughout the field for its superiority of design, dependability and quiet operation.

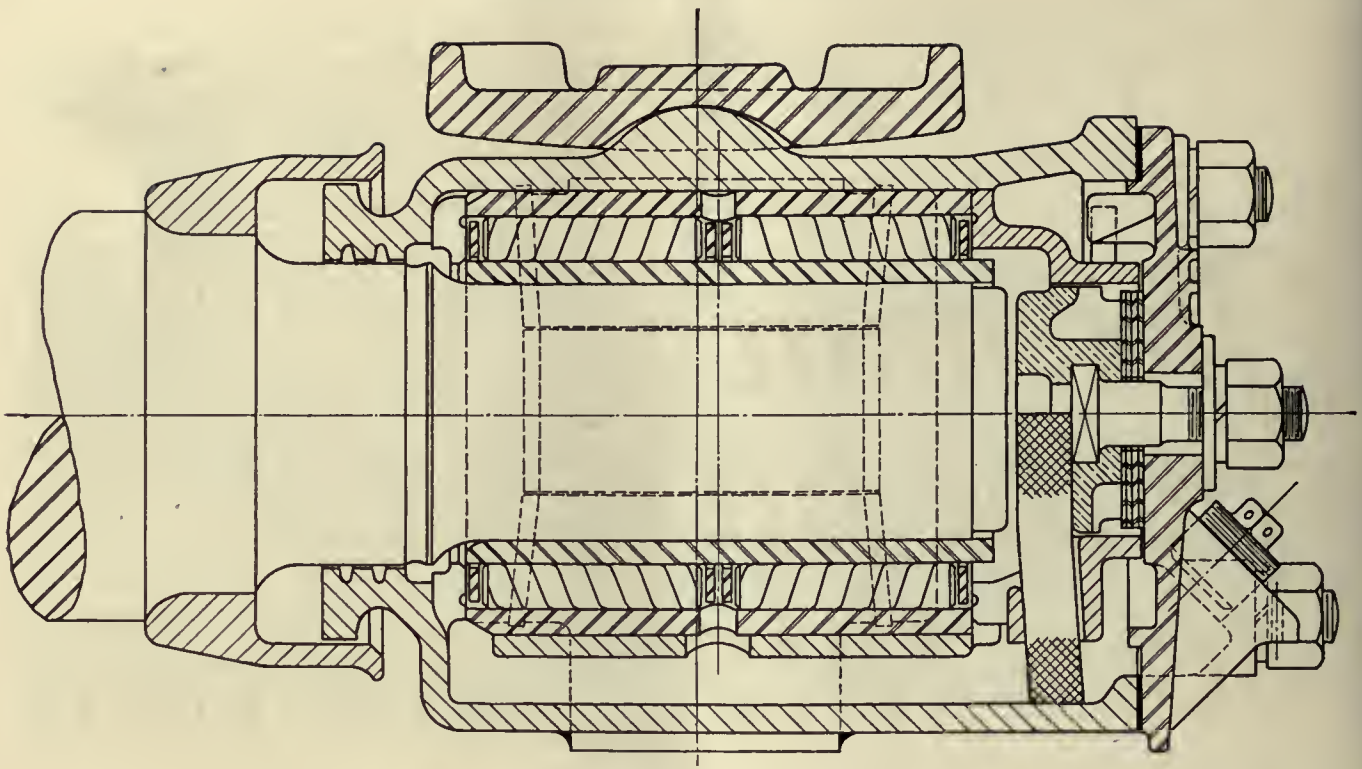
*When specifying pneumatic door operating equipment or electric car heaters it will pay to investigate Consolidated products.*



## CONSOLIDATED DOOR OPERATORS

## Consolidated Car-Heating Company, Inc.

New York ALBANY, N. Y. Chicago



# HYATT *improves* the electric railway journal box

Experience has suggested several refinements in the Hyatt Roller Bearing Journal Box for Electric Railway cars. The drawing reproduced above shows a sectional view of the improved box which is now available for standard A. E. R. A. pedestals.

The most obvious change is the addition of the new spring seat rocker, which lends greater flexibility to the mounting and compensates for spring irregularities. The spring seat rocker construction may be altered to suit varying truck design.

Longer bearings and raceways have been provided, increasing the bearing capacity. There are also several minor alterations in design, which have been made after careful observation of boxes in service.

Electric railway companies will save power, reduce maintenance, and increase comfort of passengers by modernizing with Hyatt Roller Bearing Journal Boxes. The Hyatt way is the Saving Way.

HYATT ROLLER BEARING COMPANY
Newark Detroit Chicago Pittsburgh Oakland

*Details on box sizes and capacities may be had by writing the nearest Hyatt office*

HYATT
ROLLER BEARINGS
PRODUCT OF GENERAL MOTORS

CLOTHS TAPES TUBING FIBERS PAPERS CORDS TWINES
VARNISHES OILS STICKER
CLOTHS TAPES TUBING FI
VARNISHES OILS STICKER
OTHS TAPES TUBING F
LS STICKER
TUBING FI
CKER
FI
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FI
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R

# The man in the pit sees this





This is the part of the car that gets the water, slush, dust, mud, and hard wear. Whether the man in the pit sees it often—and every time he does it costs money—depends on how thoroughly it is protected.

Car cables wound with G-E Paragon tape are prepared for long, faithful service. This tape is of sticky, waterproof material which readily absorbs varnishes and treating compounds. Its gripping quality is unimpaired by age. G-E Paragon tape is but one of the complete line of G-E insulating materials that keep cars on the line and away from the pit.

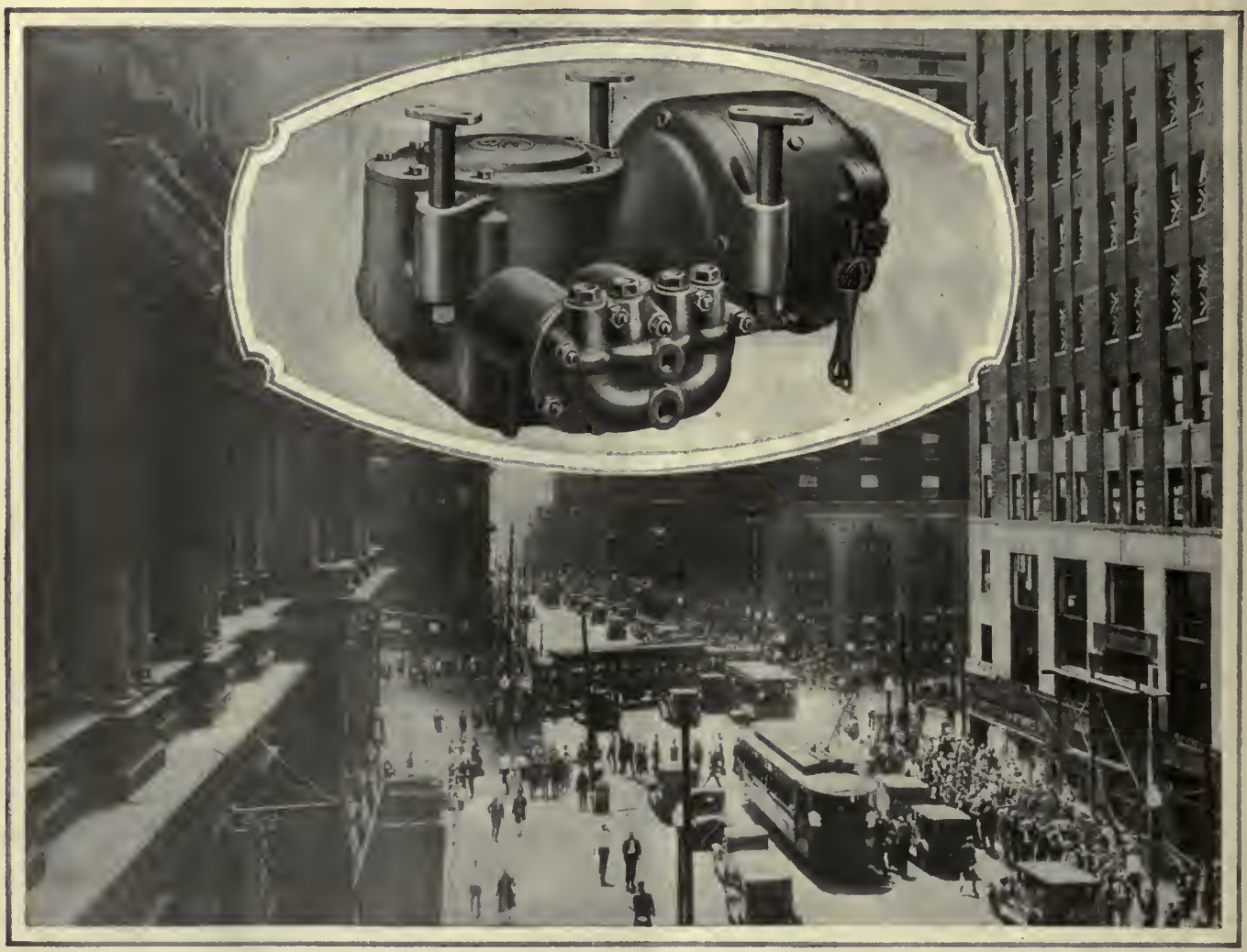
G-E insulating materials are sold only by G-E Merchandise Distributors located throughout the country who are equipped to give you prompt service. Get in touch with the G-E Merchandise Distributor near you or write to the Merchandise Department, General Electric Company, Bridgeport, Connecticut.

Insulating materials described in Catalog GEA-603 are identical with those made by General Electric for its own use. Send for a copy to the Merchandise Department, General Electric Company, Bridgeport, Connecticut.

800-210

# GENERAL ELECTRIC

MERCHANDISE DEPARTMENT, BRIDGEPORT, CONNECTICUT



# 100 CP-27 Compressors *for Cincinnati*

The operation, since 1922, of five G-E Type CP-27 compressors, and of 39 purchased since then, has prompted the Cincinnati Street Railway Company to make a further addition of 100 air brake equipments with CP-27 compressors and complete safety features.

Exceptionally well designed, from both mechanical and electrical standpoints, G-E Type CP-27 compressors are building a record of reliability and economy everywhere.

330-93

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

# Electric Railway Journal

*Consolidation of*
*Street Railway Journal and Electric Railway Review*

McGraw-Hill Publishing Company, Inc.
James H. McGraw, *Chairman of the Board*
Malcolm Muir, *President*
H. C. Parmelee, *Editorial Director*

CHARLES GORDON, *Editor*

Louis F. Stoll, *Publishing Director*

*Volume 72* New York, Saturday, November 17, 1928 *Number 20*

## Get Ready for Winter

THE winter season brings added work to most maintenance departments. Passenger loads are heavier because rain, snow and slush make walking and automobile driving disagreeable, and more people seek the comforts of street cars and buses. Stops are longer and so the schedule is more severe. The equipment itself is subjected to more abuse. Frequently cars must operate through water or slush. More sand must be used and this adds another potential source of trouble. Salt used to keep switches open sometimes causes electrical equipment difficulties.

All this means that increased attention must be given to maintenance work and added precautions taken to prevent service delays. Regular and thorough inspection of equipment is of course, the first step in avoiding failures. At this season of the year many precautions can be taken that will avoid difficulty later. Stocks of repair parts should be checked to make certain that sufficient are on hand to take care of added requirements. Lubrication must be watched closely and care taken to make certain that gear cases are tight and that covers for journal boxes and bearing housings fit tightly. Car wiring at such points as resistors and motors should be gone over carefully. Leads should be cleated firmly to prevent rubbing and chafing. A little extra work now will pay liberal dividends in reduced trouble during the winter.

## From Coal to Current

FROM Philadelphia has come news of another electrification. It is the announcement of the plan of the Reading Railroad to spend $20,000,000 on through routes embracing the community territory of Philadelphia. But the matter does not stop here. The work soon to begin presages ultimate electrification from Langhorne to New York, from Jenkintown to Philadelphia, and, after the completion of grade crossing elimination at Manayunk, through the Schuylkill Valley to Reading and Pottsville.

While the work now announced by the Reading is overshadowed by the immensity of the program contained in the recent statement of the Pennsylvania Railroad, in many respects it is no less significant than the Pennsylvania announcement, particularly in that it portends the application of electricity to the entire Reading main line. Obviously the process is one of piecemeal application. Still the facts as stated change from their nebulous form to one of real substance plans that have long been in the process of making.

However fascinating it may be to ruminate over the reported prediction of the president of the largest locomotive works in the United States that all railroads along the Atlantic coast from Boston to Washington may be electrified within ten years and to cogitate the statement that steam gradually is being driven to the great open spaces, tangible evidences are sufficient for the present. Among them are the fact that the Reading, like the Pennsylvania, is going to use the 11,000-volt a.c. system, that it presumably will purchase its power, and that bids on the preliminary work of electrification, as well as on the construction of 100 coaches, will be asked within the next two or three weeks.

So it is that the Reading statement reflects the growing realization of the value of electric propulsion as an aid in speeding up service and in increasing track capacity. It also reflects the feeling of confidence in the efficacy of superpower as best instanced in the case of the Conowingo development and the interconnection of the power systems along the north Atlantic seaboard. In other words, the steam roads have concluded that the great utilities along the railroad lines, already customers of the railroads for transportation, can well supply them with electric energy. Whether or not one accepts the prognostications of the most optimistic of the prophets of the coming age of electric propulsion for main lines, attrition is gradually changing from a prediction to a fact the process summed up in the slogan "from coal to current."

## In the Interest of the Company and the Community

OUT of the chaos incident to an expiring franchise, the maturity of bonds, the impending destruction of its credit, and distrust of the company by the public, order is slowly being restored at Omaha, but this will be only a beginning toward better transit if the city continues to play fair with the management. It is easy to dismiss this work of a year with a single sentence that records the double news that the new franchise for 30 years was passed at the recent election and that the proposal was lost to authorize a bond issue to provide funds for establishing a free bridge instead of the communities buying the present one from the railway, but that would take very little account of the record of the past and none of the possibilities of the future. And that is not a good thing.

To say that the vote of confidence in the company at Omaha was well deserved is to reiterate a truth, but it is equally true that similar favorable response is not always secured. Present concern is not with the academic question of what is and what is not ethical treatment, rather is it with the prospects ahead. The new franchise represents the work of several months by its sponsors. It protects the company and the city. It is not of the so-called service-at-cost variety, but it is forward looking in that it provides for orderly development of the local transportation system in Omaha in the future and for

**This is the issue in November that is devoted essentially to maintenance and construction subjects**

co-ordination of cars and buses. The drafting of the grant, the principal provisions of which were reviewed in the issue of ELECTRIC RAILWAY JOURNAL for Nov. 10, was approached by the management from the angle that Omaha is a great progressive city, but that to maintain that position, the city must have an up-to-date local transportation system with the railway as its backbone. And in urging the grant the representatives of the company suggested to the voters that they try to visualize Omaha without street cars.

On the bridge proposal, discussed in an editorial in the JOURNAL for Nov. 3, page 789, the public certainly reacted favorably to the clear-cut, frank explanation of the position of the company, since the voters rejected the proposal to erect a new free bridge. Negotiations will now be begun for the sale of the railway's present bridge to the community.

During the franchise campaign President Shannahan did not mince words about the fact that the company was fighting for its very life, even saying to the rank and file that that "means that you men are fighting for your jobs, for if the franchise is lost that means receivership and probably bankruptcy." The disposition of the franchise and bridge issues appear to indicate that the new management has been successful in converting the public to the understanding that the best service at the lowest cost can only be obtained in a community through the operation of all public transportation by one efficient organization. Certainly the management has succeeded in having the employees realize that their interests and those of the company are the same, with the result that they are making every effort to be useful public servants in an honest endeavor to make friends for themselves and the company. These are the fundamental principles essential to successful local transportation. In securing their acceptance the company has accomplished something really worth while for itself and for the community which it serves.

## Detroit Rid of Its Jitneys

AT LAST Detroit has gotten rid of its jitneys. It was a six-year fight. Offhand it might seem that a city would have control of its own streets, and the United States Supreme Court has so ruled in certain cases, but in the jitney case that issue did not apply or was not raised. The case has been followed in the JOURNAL in its various legal phases, but present concern is not so much with the technical issues involved in the suit as it is with the prospects for the future.

No sooner had their rights been abridged than the jitneys became very humble. Whereas they had been amenable only to their own self-imposed regulation, operators are now ready to submit to any reasonable regulation, to run under the direction and control of the very officials whose authority they had questioned and to furnish suitable bond or surety and to comply with any requests of the city. But it would appear that their humility has come too late.

The jitney as a jitney is an anachronism. In Detroit it found a place for itself only because of the peculiar local situation incident to the city taking over the local lines of the Detroit United Railway and being required to convert an inheritance of junk into an articulate system during the period of Detroit's most rapid growth, an era that saw great advance by the automobile as a public transportation agency. This was the period that saw the development of the local transportation system under city auspices to the point where the property had been virtually rebuilt, the articulation of the railway and the bus in service under the same auspices, the subsequent use of the bus in mass transportation by the Detroit Motor Bus Company, and the promulgation of grandiose plans for rapid transit development which have not yet materialized. Meanwhile resort was made to various expedients, the jitneys being forgotten except for the legal battle being waged against them.

With the jitneys off the streets, the municipal railway department is going ahead with its plans for still greater co-ordination of rail and bus lines, but it remains a fact that it has been quite a problem to assume over night the traffic load so suddenly thrown upon the local transportation system by the withdrawal of the 500 jitneys. The latest proposal is a de luxe bus service for Grand Avenue and for Woodward Avenue, with 16-passenger vehicles, a service the municipal railway department was precluded from rendering so long as the jitneys were being protected temporarily in what they assumed were their rights. This is another move and a forward-looking one in the greater articulation of the transportation services of the city, anticipatory of the time the city actually does something really worth while transit-wise. The management of the systems as now constituted is able, but under the present conditions limitations are imposed that preclude anything like the realization of real rapid transit service.

## To Help Them Stop, Look, And Listen

THE need for uniformity in highway crossing protective devices grows daily. Last year, according to figures compiled by the Interstate Commerce Commission from reports of Common Carrier Railroads of the United States, 2,371 persons were killed and 6,613 were injured in highway grade crossing accidents. Compared to this only 402 individuals were killed and 675 injured in similar mishaps in 1890. It is obvious that this increase in casualties from 1890 to 1928 can be credited almost, if not wholly, to the advent of the automobile as an attractive private transportation vehicle.

Vehicular speeds have steadily increased from those possible in the '90's until at present automobiles are traveling the highways of the country at rates equaling and in some instances exceeding those of our fastest trains. To beat the Twentieth Century Limited is a sport which has stirred the imaginations of motorists and even engaged the efforts of motorboat speedsters. Despite the recent Supreme Court decision putting the blame on the motorist for collisions involving railroad trains, such accidents continue to exact their toll of human lives. Apparently the mechanical limitations to the speed of modern motor cars—still far from reached—constitute the only deterrent to the rate at which occupants of these fast-moving vehicles can and do approach and pass over railroad crossings. Whatever effect the precautionary "Stop, Look and Listen" appeal ever possessed has long since been completely dissipated.

The horse-drawn vehicle carried, at best, three or four persons in addition to the driver, and everyone generally was in a position to protect himself from dangers incidental to crossing railroad tracks. Except for a runaway the rate of travel with horses was sufficiently leisurely to permit of the safe abandonment of the carriage in any emergency and at any normal pace. Not so with the modern motor car, to say nothing of the 30 to 40-passenger bus. In either instance the passengers are wholly dependent upon the skill and discretion of the driver to protect them from hazards of the road, including col-

lisions with other mediums of transportation. Motor vehicles travel distances never possible with horses. Single trips may extend through several states or even from coast to coast. A trip of 300 to 500 miles in a day is no longer uncommon. Highway travel such as this, when considered in the light of the annual grade crossing casualties resulting therefrom, represents an incontestable reason for the standardizing of railroad crossing warning and protective devices whose very uniformity will constitute a factor favorable to their observation by travelers.

There is certainly the most acute need for the development of a system of signs, so standardized in size, shape, color and wording, that a motorist, speeding over improved highways, perhaps through entirely unfamiliar territory, may instantly comprehend the specific warning intended by that type of sign wherever he encounters it. An attempt at uniformity is to be found in the signs bearing the numbers of the so-called federal highways. It becomes all the more necessary then, that from this beginning in standardization as applied to highway markings these same motorists, growing accustomed to uniform highway markings, be given the benefit and the added protection of a similar standardization in devices or signals denoting the presence of railway trains.

## Take Advantage of Improved Parts and Repair Materials

IN ELECTRIC railway maintenance it has been proved again and again that the use of the highest grade repair parts and materials obtainable is most economical in the long run. Very little calculation is needed to demonstrate that fact. The cost of a single service failure will wipe out many dollars of apparent savings made in the purchase of materials or parts. But the use of high-grade parts is not alone sufficient. The opportunity frequently exists to incorporate improved designs that offer better performance, increased reliability or other distinct advantages in comparison with the original part or material that is being replaced.

When a car is down it should stay down until thoroughly ready to be placed in service again. The best insurance against service failures lies in doing a thorough job of repair or overhaul. Frequently that involves, also, taking advantage of the many new materials and improved parts available to the maintenance departments. One company is installing manganese wear plates at truck points subject to excess wear. Another is substituting higher grade springs for those used in the original design, as the original springs were found to sag after considerable use. In the repairing of armatures, modern insulation permits the use of a dielectric strength superior sometimes to that of the original armatures.

Serious defects may appear in original equipment. Obviously it is poor business to perpetuate the trouble, and the only remedy lies in the adoption of an improved part or material. On one large property which experienced a great deal of trouble from broken armature shafts on practically all types of motors, the adoption of a high-grade alloy steel at considerably higher unit cost of material, resulted in a large reduction in service failures and effected a large ultimate saving in actual repair bills. Changes in design of standard parts should, of course, be made only with extreme caution and after thorough experiment and consultation with the manufacturer of the original equipment. But there should be no hesitation in the adoption of improved parts or materials that will increase reliability, improve performance or reduce operating or maintenance costs. When overhauling or repairing equipment there is frequently an opportunity to take a step forward instead of merely making replacements in kind. Failure to take advantage of this opportunity is not in keeping with the modern spirit of progress in the industry.

## Robots Not Wanted on the Platform

CONCEPTIONS of Carl Capek, creator of the fictional robot and successor to Mrs. Shelley, who introduced Frankenstein as the father of automata, appear likely to be outdone by the engineer in his developments of the mechanical man. Televox proved this at Cleveland, although the application was not one with which the man on the street is likely to come into contact. But your average man won't have to wait long. Capital, big capital, has promised us that soon the nickel cigar in our favorite emporium will be handed to us by a mechanical figure in the outward garments of a man who will thank us no less feelingly than does his slightly more human counterpart now behind the counter. And the 5 and 10's are going in for the same thing. Yet there is not much reason to fear that soon all of us will have nothing to do but move about in a world in which the automata about us will make man conspicuous by his very mobility.

We cannot, for instance, conceive the automatic conductor, even though some of the present generation of conductors have at times by their seeming indifference offended much more than could any mechanical man, from whom cut and dried answers are to be expected. If a conductor was nothing more than a mechanism for ringing up fares, then street railway men might be expected to welcome Televox. But the man on the platform must be far more than that. "Ride salesmanship" or "trainmanship" express present-day thought on the requirements of the platform man. To achieve these qualifications, methods of education and training are receiving wide attention.

Drill was one of the words used in Cleveland. This at first has a strange connotation. Too often it is associated purely with physical movements. But there are far greater possibilities in the word. The conductor has become a great asset to his company who can always be counted upon to enforce a rule so that the rule will not be made to appear to have been drawn to govern the passenger. Likewise that man on the back platform is an asset who always shows a sincere desire to serve the public. Again, by careful training the platform man can be so instructed as never to try to prove the passenger wrong even when he really is.

There are some men who never could be made to understand the niceties of passenger psychology so that the reaction of routine contacts will redound to their own benefit at the same time they appease the passenger. But they can perhaps be taught and trained, through a process of drilling, to handle the many situations that arise on a car platform in a manner calculated to produce desirable reactions. Drill does not necessarily make robots of men. The actor and the public speaker are drilled. The debutante's finishing school includes the process of drilling. Drill consists of practice which makes proper performance easy and semi-automatic. A school of trainmanship may profitably be a course in platform drill.

## Mechanical Methods

# Expedite Track Paving

**Machines and organization in Milwaukee permit the laying of 700 to 900 sq.yd. of concrete pavement in eight hours**

*By F. G. Hibbard*
Assistant Engineer of Way and Structures
The Milwaukee Electric Railway & Light Company,
Milwaukee, Wis.

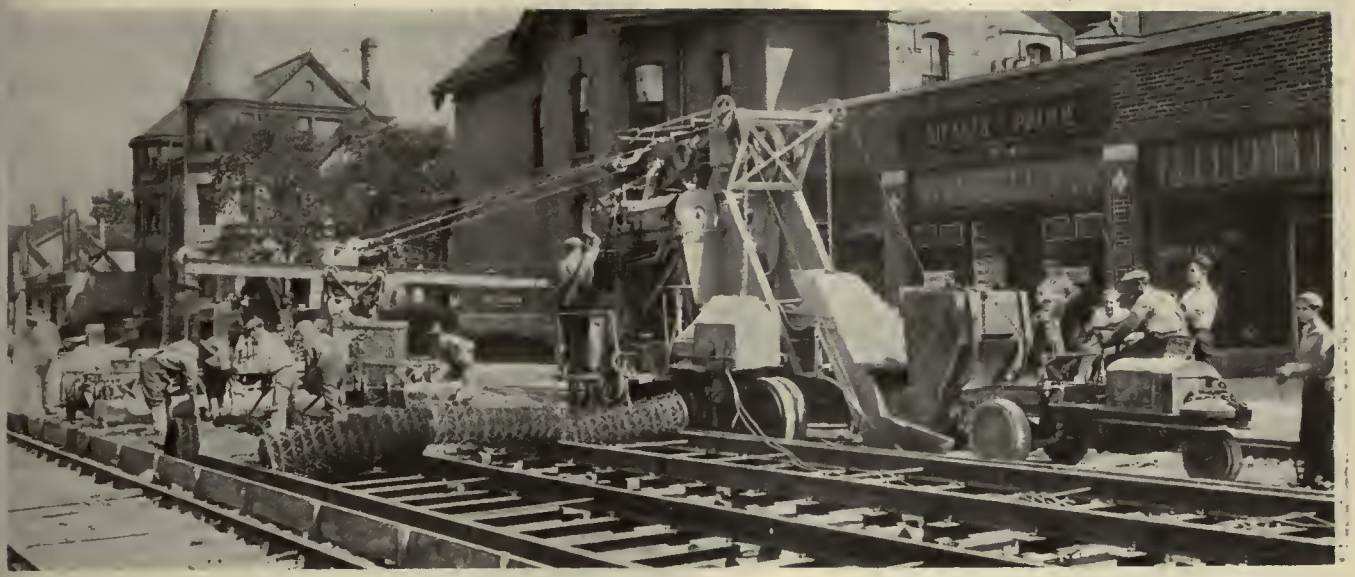


**The systematic arrangement of the mechanical equipment on the street expedites the track paving operations**

ON MANY railways, both large and small, concrete is now the standard for track zone pavement. This increased popularity of concrete for street railway track zone pavement must be justified, for its extended use by traction engineers is undoubtedly based on satisfactory experience.

Good materials are essentially necessary for good concrete pavements. For guidance in the selection and testing of materials for concrete pavements, the Milwaukee Electric Railway & Light Company uses specifications of the American Society of Testing Materials. The company is fortunate in having an exceptionally good deposit of sand and gravel; also an excellent quarry supplying a high grade of crushed stone. When thoroughly washed, these materials are well adapted for the manufacture of concrete.

For several years we have been using the fineness modulus theory developed by Prof. Duff Abrams and



Laying the top course, handling the "mix" almost entirely by machines

methods proposed by the Portland Cement Association in the designing of concrete mixtures. Our specifications call for a 1:2:3½ mix or a ratio of one part of cement to 5½ parts of sand and coarse aggregate. Instead of starting with a specified strength as is usually done and working to obtain this with a minimum of cement, we start with a fixed amount of cement and strive to secure concrete with the highest possible strength and wearing qualities.

### Modern Equipment Reduces Labor

In determining the equipment for laying concrete pavement we were obliged to give first consideration to the limited space between car tracks and curbs. Our plant was laid out to work efficiently in this restricted area. A 21-E mixer mounted on rubber-tired wheels, which permits easy transportation over city streets, is equipped with a boom of sufficient length to dump the concrete into the track zone when the mixer is placed on the side of the street. Two Barber-Greene loaders, one for sand and one for gravel, with accurate measuring hoppers are used for loading these materials into three-wheel Clark Tructractors for transportation to the mixer. These tractors can be maneuvered in a very limited space and are equipped with dumping bodies of sufficient size to carry a full charge for the mixer. The cement is loaded by a specially designed skip so as not to slow up the operation of the tractors, as a result the loading of cement directly from stock piles takes place. A special adaptation of the Lakewood finishing machine, which was developed by our company after a year of experimental work, permits us to strike off, tamp, form the throatways and belt the concrete so that a minimum amount of labor is required in spreading the concrete and finishing the pavement.

### Materials Carefully Measured

The amount of material per foot of track is carefully calculated, and where sufficient room is available between the curb and track, the necessary sand and gravel are dumped from differential motor dumping cars approximately as shown in an accompanying illustration, and the cement is piled on the parking strip between curb and sidewalk. When the street width is too limited to permit of the proper storage of materials, a temporary curved track is used to carry the storage piles to the intersecting side streets. This track is specially constructed in sections so that it may be laid on top of the permanent track and removed in a short time and at little expense. After the materials have been placed, the equipment is moved into position, the loader hopper set to measure the predetermined quantities of sand, gravel and cement, and the water gage on the mixer set for the correct amount of water for each batch.

The sequence of the operations is as follows: The tractor receives the proper amount of gravel for one batch from the loader, proceeds to the cement skip and then to the sand loader for the correct amount of these constituents, and then dumps the load directly into the mixer skip. As the cement is loaded between the gravel and the sand there is little danger of its being carried around the street on windy days, and it does not adhere as readily to the mixer skip. After the proper mixing time which is controlled by a batch meter, has elapsed, the concrete is so deposited as to avoid an undue amount



The gravel loader speeds the handling of the aggregate



**Cement skip shown in action**

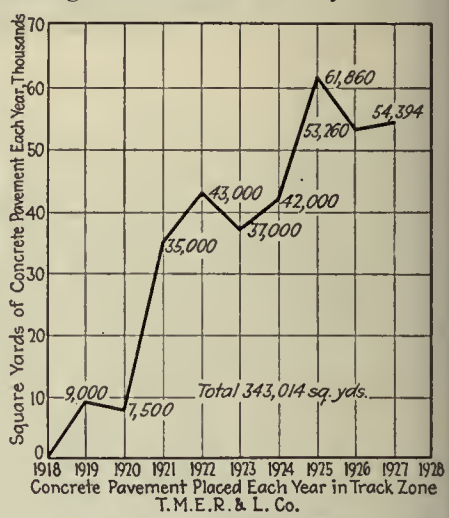
of shoveling. It is then carefully spaded around the rails and ties to a depth of 2½ in. below the top of the rail for a length of approximately 50 ft. Type 0583 American Steel & Wire triangular mesh reinforcement is then placed in position and immediately covered with a top course of concrete which is struck off flush with the running surface of the rail by the finishing machine at the same time it tamps and forms the throatways. The surface is then belted and the edges of the throatways dressed by hand finishing. The reinforcement is handled in rolls and is spread out as required. The concrete is laid with about a 1 in. slump which requires tamping but once to produce sufficient mortar on the surface for finishing. Excessive tamping produces too much mortar on the surface, disturbs the uniformity of the mix and does not leave the wearing surface in a good condition to resist impact and abrasion.

The following crew is employed in placing concrete pavement: Three men spreading concrete, one man on reinforcement, one man operating finishing machine, one man operating mixer, two men operating loaders, three men operating tractors, two men handling cement, three men cleaning up behind mixer and loaders, two men finishing and one foreman.

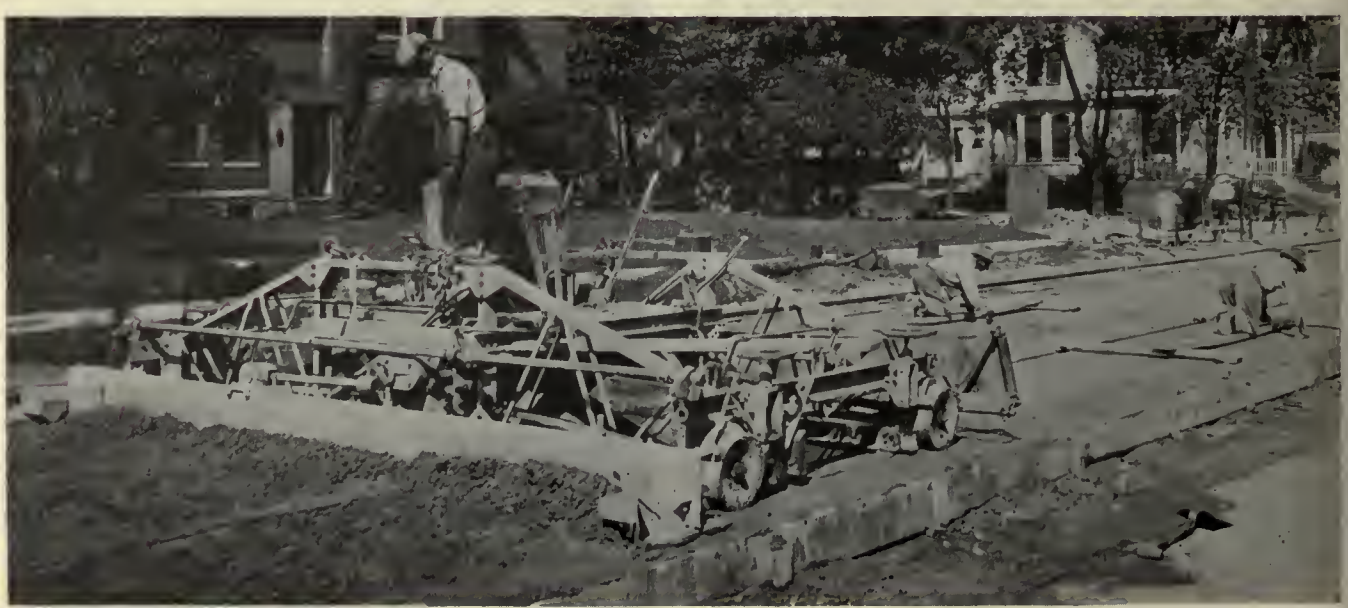
When steel tie construction is used, two men with tamping bars are added to the crew to work the concrete around the ties. When cement is handled from stock piles on the side of a street where cement skips cannot be used, an additional man is added to the crew. Our company forces lay about 700 sq.yd. of concrete pavement in eight hours. We have laid as high as 942 sq.yd. in seven hours.

### Frequent Field Tests Made

Slump tests are made from time to time to check the consistency of the concrete and 6x12 in. compression test cylinders are molded to check the strength and to determine the length of time required before the pavement is to be opened to traffic. We are working on a method of making strength tests in the field by the use of a simple device for breaking small cantilever beams. These tests are to be conducted day by day, and as soon as sufficient strength is shown by the test specimens, the street will be opened to traffic. A check on the bulking of sand is made by inundating a small sample in a graduated cylinder. An accompanying illustration shows a typical cross-section of standard track construction using concrete pavement. Formerly we used a $\frac{5}{16}$x2-in. flat tierod with 1-in. round terminals which had a marked tendency to crack




**T. M. E. R. & L. Company placed a total of 343,014 sq.yd. of concrete pavement in its track zones during the past nine years**



**Making the first strike-off by machine. Hand finishers are shown at work in the background**

the pavement. Last year 1-in. round tierods were substituted, materially reducing this cracking.

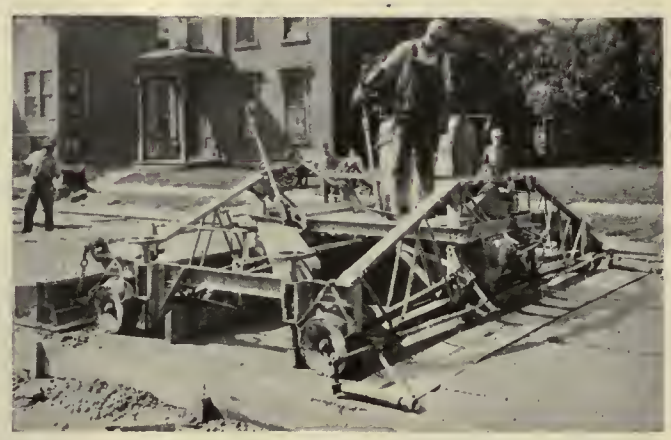
At all street crossings, except in the outlying districts, granite block stretchers are employed along the gage side of the rail for the full street width, to reduce the width of the throatway and to provide a smooth intersection. The throatway width is reduced from 5 in. to 2¼ in. The granite blocks have a greater resistance to crushing than concrete and their use at street crossings adds substantially to the life of the pavement. In placing the concrete pavement, forms are set to provide proper space for the blocks which are later laid on a 1 : 3 cement-sand cushion and set in a 1 : 1 cement-sand grout. Where cross street traffic is exceptionally heavy, the entire width of the track zone is paved with granite block pavement.

For the last few years we have been using 2½ lb. of granulated magnesium free calcium chloride per square yard for curing. This material is uniformly spread over the surface of the pavement with a mechanical spreader. If rain falls within four hours after the application of the calcium chloride, a second treatment is required.

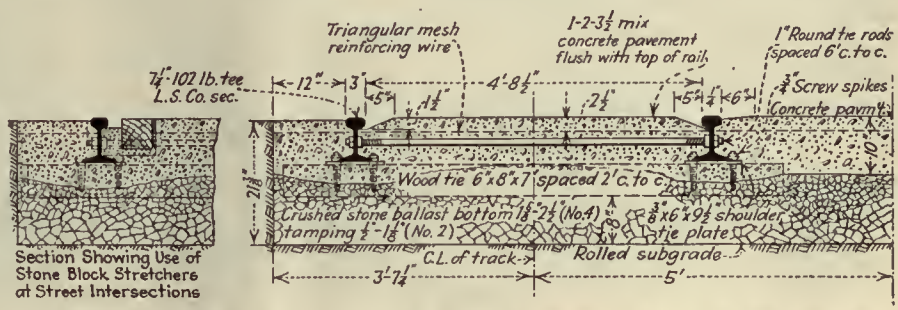
It occasionally becomes necessary to arrange to open the concrete pavement to traffic in a relatively short time and these special conditions are met as follows: If the pavement is to be opened in 24 hours, Lumnite cement is used. If the pavement is to be opened in two to three days, a choice of two methods is available: The use of so-called high-early-strength cement; or a richer mix with a low water-cement ratio. In the second method, increasing the mixing time and the addition of 2 lb. of flaked calcium chloride in solution will aid materially in obtaining desired results.

When it becomes necessary to lay concrete in freezing weather careful consideration is given to the following details: Subgrade must not be frozen; materials must be heated; hot water must be used in mixing concrete; mix is kept as dry as possible; 2 lb. of magnesium free flaked calcium chloride is used in solution to each bag of cement, and sufficient covering is used to protect the pavement from freezing.

The subgrade is protected against freezing, and with crushed stone ballast this is relatively easy. Gravel is avoided as a coarse aggregate during the winter months as it holds a high percentage of moisture and requires considerable heating before it can be used. Crushed stone is therefore substituted. The crushed limestone and sand are heated over old pipes, or when sufficient drier capacity is available, sand may be dried and heated at the sand drier plant. We have also made use of a hot mixer for laying asphalt pavements to heat the aggregates in cold weather. A sprinkler car is used for transporting hot water. This car is switched into the shops and a steam line run into the tank during the night-time. In the morning a portable boiler mounted on a small flat car is attached and the two are taken to the job where a steam line is run from the boiler to the line carrying the water from the car to the mixer. Air pressure is maintained on the tank to run the water into the mixer. A



**Making the second strike-off, tapping, cutting throatway, and belting—four operations handled simultaneously by the same machine**




**Cross-section of standard track construction in Milwaukee. Wood ties are used with crushed stone ballast, and concrete pavement reinforced with standard wire mesh. The small cross-section at the left shows the stone block stretcher used at street intersections**




**T. M. E. R. & L. Company's standard 10-in. concrete pavement. It will be noticed that the crossing is of all-granite construction**

saturated solution of calcium chloride is prepared and one quart of this solution contains approximately 1 lb. of calcium chloride, which is added to the mixing water. By the use of heated aggregates and hot water, a hot mixture is obtained. The calcium chloride solution produces a quicker set and allows the finishing operations to be completed and the covering placed long before there is any danger of freezing.

For covering we lay two-by-fours, 18 ft. long, across the track, blocked up on the rails to keep them off the fresh concrete. Over these supports canvas is placed and then a substantial covering of marsh hay. After 24 hours the supports and canvas are removed but the hay covering is allowed to remain until the pavement is opened to traffic.

Our oldest concrete pavements are down nine years, and so far we have had little maintenance expense. Transverse cracks occur at short intervals, usually over a tierod. In filling them, a truck filled with dry sand, asphalt and fuel is used to tow an air compressor and a tar kettle. The cracks are cleaned out by compressed air, filled with hot Texaco No. 96 asphalt and covered with dry sand. The following constitute the crew: One man cleaning out cracks, two men filling cracks with asphalt, two men sanding cracks, one equipment operator and one truck driver.

The accompanying graph indicates by years the yardage of concrete pavement installed up to and including 1927. It is estimated that approximately 61,500 sq.yd. will be laid in 1928. Starting with 9,000 sq.yd. in 1919, a maximum of 61,860 sy.yd. was laid in one year, in 1925, and a total of 343,014 sq.yd. in nine years.

The advantages gained through the use of concrete pavement in our track zone prompt the following conclusions:

1. Concrete pavement aids materially in holding track to line and surface and thus substantially increases its life. Loads from street traffic are uniformly distributed over the subgrade.
2. Concrete pavement can be successfully laid by company forces.
3. Concrete pavement in track zone provides a smooth surface for street traffic, equally acceptable to the abutting property owners and the drivers of pleasure cars and trucks, and it has won the approval of city officials in all municipalities in which we operate.

Milwaukee originally required the track zones to be paved with the same materials used by the city in paving the rest of the street. In November, 1923, an ordinance was passed by unanimous vote of the Council, permitting the company to install concrete pavement in its track zone in lieu of all other types. This approval has stimulated the development of equipment and control methods to the end that tracks may now be paved expeditiously and with high-grade concrete pavement.

# Babbitt Room Modernized with Electrical Equipment

**Bearings are boiled in Oakite, after which old babbitt is removed and new babbitt is cast with aid of thermostatically controlled melting pots**

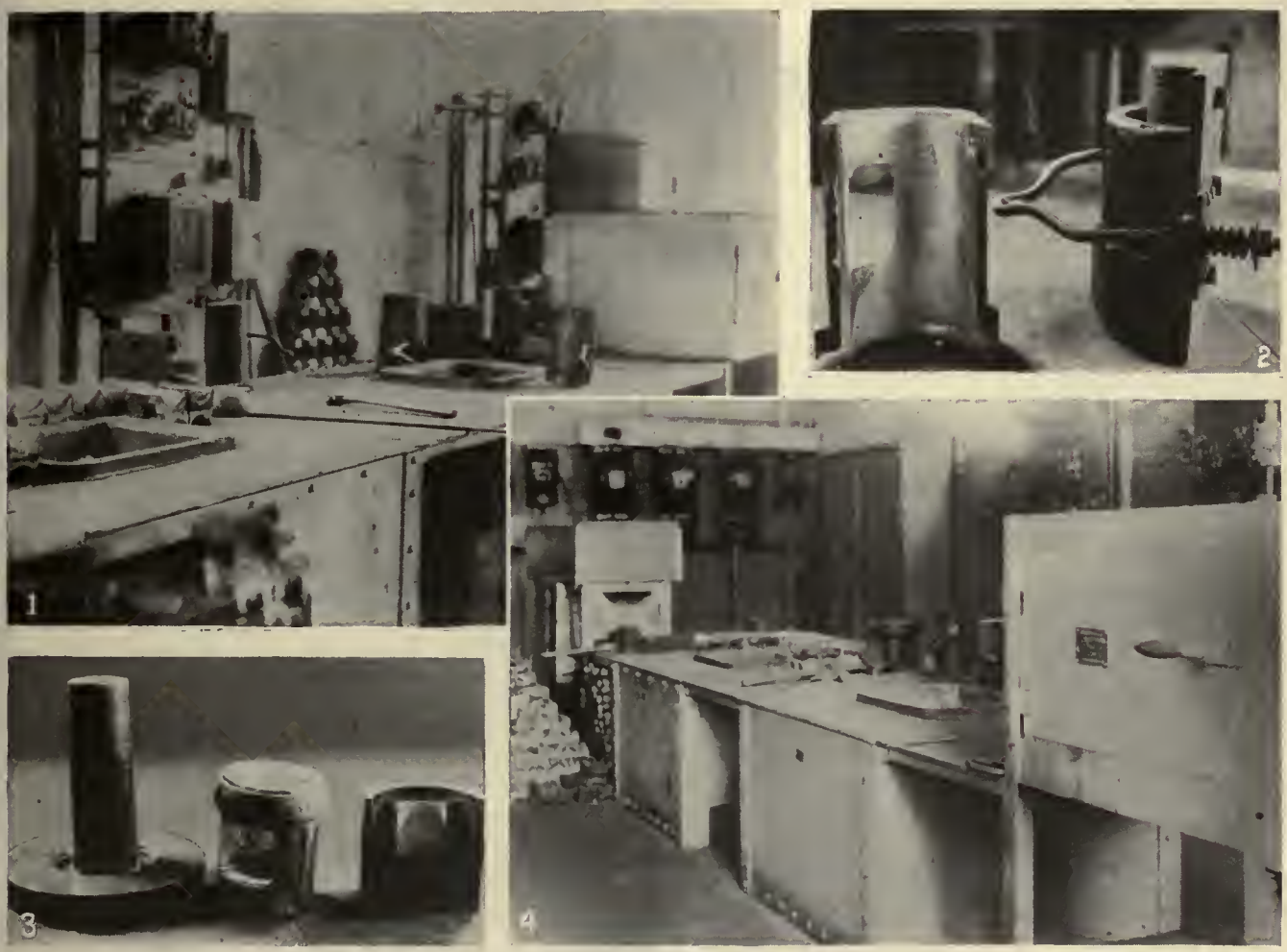
BEARINGS of the Los Angeles Railway, both armature and axle, are rebabbitted in an electrically operated babbitt room which is an example of cleanliness and efficiency. Electrically operated pots and a preheating cabinet located in the room are thermostatically controlled, resulting in a uniform pour of metal. In addition to the three pots and the preheating cabinet there is also an electrically operated Oakite boiling vat. This room is an example of the modernization of the South Park shops which has been steadily going on with a view toward making a clean, efficient plant. The appearance of the babbitt room resembles that of a bakery, with its white enameled ovens and orderly appearance of bearing shells and materials. The equipment is also painted white, contrasting with the electric switches on panelboards mounted around the room.

Old bearings received from the division shops are first placed in the Oakite vat, where they are boiled to remove all dirt and grease. This vat is at one end of the table of pots and furnace. The bearing is next placed in the first of the three electric melting pots, where it is heated to between 700 and 800 deg. F. until the old babbitt is removed. Each pot has a capacity of 650 lb. of babbitt. It is set below the surface of the metal table, the heating elements being in a cabinet underneath. The control panel, on which are mounted switches, pyrometer and control unit, is mounted back of each pot.

Cleaned shells removed from the melting pot may follow either one of two courses. If they are to be rebabbitted immediately they are placed around the melting pot so that their temperature will be maintained. Otherwise they are placed in the preheating oven, which is located on the bench between babbitt pots Nos. 2 and 3. This is an airtight oven, electrically heated to between 175 and 200 deg. F. This cabinet measures approximately 24 x 30 in. It occupies one section of the bench.

If either course is followed the shafts are at a temperature of around 200 deg., which permits pouring. Babbitt pots Nos. 2 and 3 are used for pouring. No preparation is made of the iron shells, as they have anchor lugs which hold the babbitt in place. In the case of brass shells, the inside is swabbed with an acid cleaning flux of zinc chloride.

Various types of mandrels and forms are used. With split armature and axle bearings, a clamp is used to hold the form to the split mandrel. The clamp consists of a piece of ½-in. round steel formed to a wishbone shape with one arm extended. This extended end of the clamp is threaded and passed through a lug fastened to the back of the split mandrel. A spring and nut set the tension on the clamp so that when it is swung into position it holds the form against the mandrel. This is shown in an accompanying illustration as applied to a split armature bearing. An example of the work done



**Poured bearings before being sent to the machine shop are cleaned by a mechanic in a wire semi-inclosed portion of the workbench**

Nos. I and 4. Two views of the electrically operated and controlled babbitt pot, preheating furnace and Oakite cleaning vat which are features of a babbitt room which is noteworthy for its cleanliness and orderly appearance. It has an output with one man and helper of approximately 2,500 lb. of babbitt per day for bearings of the Los Angeles Railway.

No. 2. A split mandrel, form and wishbone clamp used for pouring split armature and axle bearings. An unfinished poured bearing is shown at the left.

No. 3. Solid bearings are poured around the mandrel with grooved face.

in this manner is shown in the same illustration by a split axle bearing which has been cast in a larger form than that used for the split armature bearing.

Solid armature bearings are cast around a mandrel which has several grooves in the base to furnish the necessary collar of the bearing to take up end play between the armature and case. The form used to block out the window in the bearing is at the extreme right in the illustration which also shows the mandrel and finished bearing.

In pouring bearings use is made of a self-skimming ladle. After a bearing is poured there is little work to be done on it other than to clean up the edges. A mechanic working in a screened portion of the workbench chips off the superfluous metal, thus preparing the bearing for the finishing. An axle bearing with a diameter of 4½ in. has enough metal left on it for a $\frac{3}{32}$-in. lathe cut for finishing.

With this electrical equipment, the orderly arrangement and utilization of the space in the babbitt room, one operator with a helper can pour approximately 2,500 lb. of babbitt per working day. By arranging the equipment in such a manner that a bearing passes from one process to the next without unnecessary handling, much time is saved.

## Accident Information Presented Effectively

ENLISTING the interest of trainmen in accident prevention and the proper preparation of accident reports has been done on the Sacramento Street Railway by a novel method. This was described by S. B. Elmore, assistant superintendent of the company in a paper read before the California Electric Railway Association at the meeting held in San Francisco.

Trainmen's meetings lasting one hour are held monthly at the carhouse at which time one or more of the serious accidents of the previous month are discussed in detail. The report of the accident as turned in by the trainmen is first presented, after which are given excerpts from the statements of witnesses as secured by the company's investigator. Progress of negotiations leading up to the settlement, if one has been effected, are then disclosed. The actual names of interested parties are usually withheld. The trainmen take a keen interest in this method of presentation and the result has been reflected in more care in running the cars and in preparing accident reports, and a record of fewer chargeable accidents in operation.

# Engineers Make Suggestions fo

# Track and Line

EXPERIENCE shows that maintenance equipment is unsatisfactory in certain respects for the process of modernization now going forward on electric railway properties. To raise the standard of the maintenance work and permit more economical methods, many improved tools are needed. Prominent men in the industry have recognized this need. To start a campaign for better tools the new executive committee of the American Electric Railway Engineering Association, at its Cleveland meeting, outlined a program for focussing attention on this important subject. It was suggested that this situation be called to the attention of manufacturers through action by the maintenance men themselves in pointing out what new devices are needed and improvements that should be made in available maintenance equipment.

An announcement of the action taken by the executive committee was made in ELECTRIC RAILWAY JOURNAL for Oct. 27, and suggestions were asked for improving machines and equipment for the maintenance of cars, buses, track and line. In answer to this request several engineers have suggested some of the equipment that is needed, particularly for track and line work. These suggestions are published in this article and it is hoped that they will stimulate others to send in their ideas.

ELECTRIC RAILWAY JOURNAL takes this means of co-operating in the program proposed by the executive committee and offers its pages as a clearing house of ideas for improved equipment. We ask that all men who have experienced difficulty in any line of maintenance work send in their suggestions concerning the kind of equipment that will help them. What improvements are needed most? By co-operation of the men actually confronted with these problems, the limitations of present shop, track and line maintenance equipment can be brought forcibly to the attention of interested manufacturers. Suggestions will be published in these columns, and all maintenance men should enter this discussion.

Manufacturers also are urged to enter the discussion, to tell why some of the much-needed tools are not available and to advise how some of the suggestions can be carried out to best advantage. Letters are requested from all those who have suggestions to make regarding needed improvements in existing equipment or new devices that should be brought out.

## Better Wire Stringing Equipment, Electric Hammers and Square Threads on Turnbuckle Screws Needed

*Suggestions by* F. MCVITTIE
*Electrical Engineer New York State Railways*
*Rochester, N. Y.*

REGARDING suggestions for equipment that will provide better, quicker, and less expensive maintenance, I believe that some machine or device can be developed to string new trolley wire and take down the old in one operation. It should be designed so that the new wire can be strung to its proper tension and hung in, and the old wire can be taken down at the same time without letting it down on the ground. The methods now generally used are somewhat cumbersome, and present-day traffic introduces many hazards that may result in serious accident.

### 600-VOLT ELECTRIC TOOLS NEEDED

Another device that could be used to very good advantage is an electric hammer, somewhat similar to a pneumatic hammer, that would operate directly from the 600-volt trolley. It should be self-contained and reasonably light. It could be used to very good advantage for digging holes to set poles, as it would do away with the use of long digging bars where the holes are in dirt or clay, and it would be extremely valuable to dig holes where concrete or rock is found.

### SQUARE THREADS PREVENT TURNING

Turnbuckles of various sizes are used in trolley work, the screws of those now on the market have a standard "V" thread and, after the turnbuckles have been used under a strain the threads upset, making them useless. If turnbuckles for this class of service could be made with a square thread they would have much greater strength and would eliminate the threads turning. This would prevent the possibility of a screw stripping its thread thus allowing the trolley wire to fall into the street.

## More Automatic Devices Desirable

*Suggestions by* HOWARD H. GEORGE
*Superintendent of Research Cleveland Railway,*
*Cleveland, Ohio*

IT IS with the idea of stimulating a greater interest among electric railway engineers in the announcement which appeared in ELECTRIC RAILWAY JOURNAL of Oct. 27, asking for suggestions for better machinery for the various maintenance operations on our electric railway systems, that I wish first to congratulate the management of the publication for the prompt action taken on the suggestion of the American Electric Railway Engineering Association executive committee on this matter.

As one of the judges in the Mainte-

# *mproving*

# Maintenance

# Tools

nance Contest, I have been impressed very strongly by the comparatively large number of home-made devices that have been developed on different properties for practically the same identical operation. Certainly, one of these devices must possess certain merits which the others do not have; one must be more efficient than the others; and, if there is a real need for such machines or devices in one place, there must exist similar needs in many other places. By the same token, if such home-made devices were taken up by a commercial manufacturer and some research development work done on them, there is not much doubt but that a still further improvement in the labor-saving possibilities would result and a machine produced which would be equally applicable on many properties.

On the other hand, there are certain fields which apparently our machinery designers have feared to experiment in. I have in mind two machines which will prove of value.

### Automatic Welding of Rail Joints

The human element is a very important factor in the success or failure of arc-welded rail joints. Automatic welding has been developed for other purposes and has not only increased the speed of welding but has vastly improved the uniformity of the product. It is my belief that there would be a big field for an automatic machine for welding rail joints, and one which will justify considerable development work on the part of welding machine manufacturers.

### Use Circular Saw for Cutting Rails

There is, so far as I know, no very satisfactory portable machine on the market for cutting rails in the field which does not make it necessary to tear out a considerable amount of pavement and excavate below the rail base in order to permit its operation. These present machines are, I believe, all reciprocating in their action and make use of saw blades, which process is naturally slow. It has for many years been my thought that a machine might be developed for cutting rails in the street which would enable the cut to be made by feeding a circular saw downwards into the rail and so on through the entire rail, which, by reason of its higher speed, would make the cut much more rapidly. I believe this type of machine, if it can be developed, would find a ready market, provided its cost were not prohibitive.

There are, no doubt, many other ideas which this request will bring out, and it is to be hoped that from the suggestions thus made many pieces of equipment of real value to the industry will be developed.

## Manufacturers

What have you to say regarding the suggestions for improved equipment made on these pages?

Send in Your Comments

## Tools Needed to Permit Track Repairs Without Removing Pavement

*Suggestions by* E. M. T. Ryder
*Way Engineer Third Avenue Railway, New York, N. Y.*

As SUGGESTIONS for improved equipment in connection with the campaign of co-operation with the electric railway industry and equipment manufacturers looking toward the development of new tools for shop track and overhead departments, I would like to propose two way department items for consideration.

### Track Drills With Pavement Clearance

There are on the market efficient electric power track drills but none of them, as far as the writer knows, are designed to operate on paved track without requiring the removal of a considerable amount of pavement at the point of operation. It is suggested that a drill should be designed having the underside of the frame 2 in. above the level of the head of the tram rail with the motor mounted above the frame, possibly mounting it so as to operate directly on a vertical shaft. The lower end of the operating shaft should be kept as close to the rail as possible, using a special short bit and driving it through beveled gears. Such an arrangement would save a good deal of expense, as the item of removing and restoring pavement is a very considerable part of the cost of making joint repairs. If designed to work within 8 in. of the rail such a drill would be of especial value on elevated railways, where an inside guard rail is in use on straight track.

### Rail Grinder Designed for Transverse Power Derailing

In order to speed up the grinding of joints and corrugations heavy equipment is necessary, and recently such grinding equipment has been mounted on service cars permitting the grinding of both rails at once. The use of such equipment, however, is limited much by the necessity of running to crossovers to keep out of the way of regular cars. A short wheelbase heavy truck derailing transversely in a few seconds time seems to offer promise of filling a notable want. The cause and relief of corrugation is an ever-present problem which has not been solved satisfactorily. Apparently there is to be a steady field for grinding, and the type of equipment suggested seems to offer a decided improvement over any existing types.

## Operating Men

We want your suggestions for improving maintenance tools — What new equipment do you find particular need for?

# Maintenance of Automatic Substations

**A competent crew of maintenance men should be divided into groups for inspection and for maintenance work. Value of proper forms in simplifying work**

*By M. J. Adams*
Switchboard Engineer Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

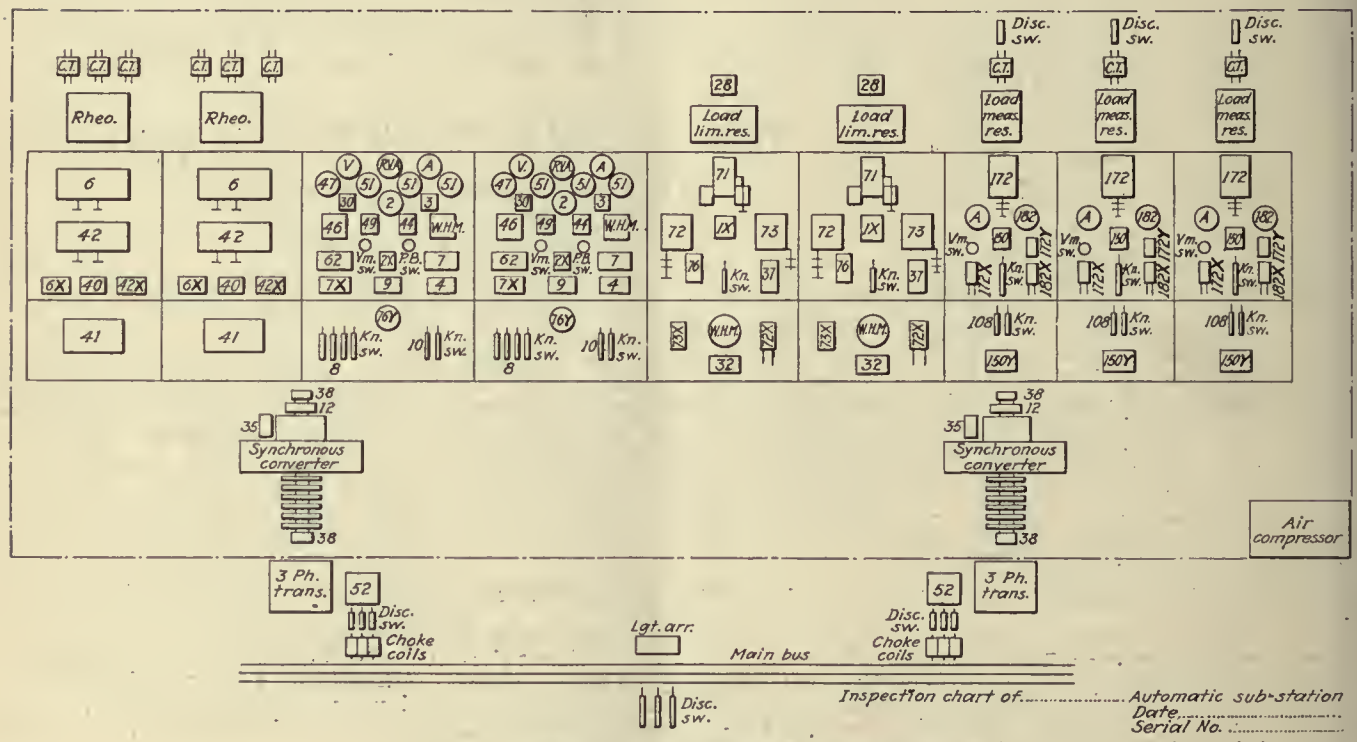



Fig. 1—Inspection chart for automatic substations

AUTOMATIC substations have brought about a change in maintenance and maintenance methods. The work has become more or less specialized and a different type of men is required to care for this type of station. The amount of maintenance and inspection necessary to keep the equipment in proper operating condition varies with the type of equipment and the application, as well as local conditions. It is quite obvious that a hydro-electric station located away from the dirt of the city will not require nearly as much cleaning and blowing out as a railway converter station located on a busy street in the heart of a city. It is also evident that the more complicated stations will require more maintenance work than the simpler type.

This article is based upon maintenance experience in railway converter stations, and all charts and schedules cover this type of equipment. Assume that the operating company has a competent crew of maintenance men, well versed in general maintenance practices and thoroughly familiar with the sequence of operation of the stations placed in their care. These men may be broken up into two groups, the inspectors and the regular maintenance crew. The inspectors should be men who have proved themselves especially adept at working out the causes of trouble and visualizing the conditions which could produce the troubles which they are to locate and cure. The inspector should visit the stations every two or three days, depending upon the severity of service, and make a casual inspection of the equipment, which should consist of reading meters, taking readings on operation indicators, checking oil levels and giving the station a visual check throughout. The inspector should also be charged with the investigation of any troubles which may arise in the operation and should have com-

plete charge of the testing and calibrating of all protective devices.

The maintenance crew should consist of trained maintenance men and helpers, working in pairs, the maintenance man doing all the inspecting and adjusting, the helper handling the air hose and taking care of the brushes and wiping down the equipment. The frequency with which this maintenance crew visits the stations will depend entirely upon how severe the service on the station is and also upon the local conditions regarding dust and dirt. In general, however, it is found that a thorough blowing out and cleaning up accompanied by a general inspection about every two weeks is sufficient. It must be understood, however, that this is only a general average and that this amount of work must be increased or decreased according to the needs of the individual installation.

The type of inspection reports and charts varies with the individual operating company, but in general they all follow along the same lines. There are two general forms of inspection charts in common use. One is merely a numerical list of the devices, with suitable blank spaces, to be filled in by the workmen. This report is very much in detail and calls for answers of the "Yes" and "No" variety and has a slight tendency to destroy the individuality of the maintenance man. In general, it is better to let the maintenance man use his own judgement as to cotter pins, contacts and general mechanical conditions of the various devices. Another disadvantage in this report is that with the various devices listed in numerical order it means that to follow the report down from top to bottom the maintenance man must keep moving from one piece of equipment to another numerically and not according to physical location, and unless the report is followed very closely some piece of apparatus may be missed.

The type of inspection report or chart shown in Fig. 1 consists of a general plan of the substation with the switchboard placed flat on the floor. All pieces of equipment are shown in their relative positions by small numbered squares, therefore the inspector or maintenance man using this chart may start in at one end of the switchboard and check each panel as he goes. A common practice is to have the maintenance men use different colored pencils in checking off the equipment which they have inspected and cleaned. In this manner if one man checks a certain panel upon which trouble is found later, he can be held accountable for not having discovered and eliminated the trouble on his previous inspection. This type of chart is also useful in that the superintendent of substations can pick out the devices that have caused trouble at a glance, as trouble is indicated by a "T" placed in the square representing the device. If the inspector or maintenance man has checked the device and found it to be O.K. he indicates this by a check mark in the square, but if he finds that there is trouble in this particular piece of apparatus he places a "T" in the square and turns the inspection report over, indicates on the back the device number and describes the nature of the trouble and what was done to remedy it. This makes a quick and convenient method of locating troubles on the chart and does not necessitate the reading of all of the details.

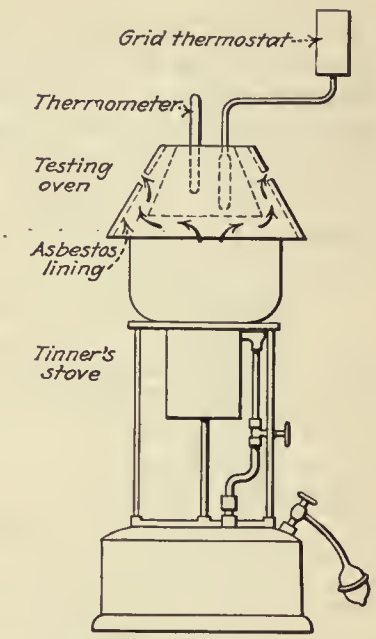
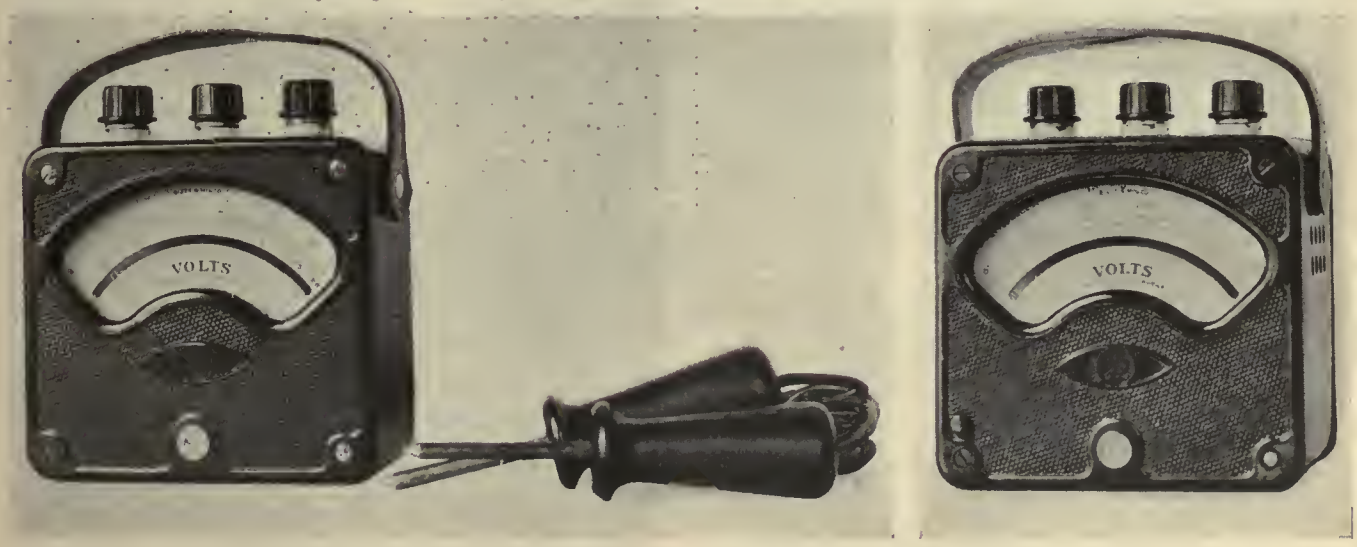



**Fig. 2—Oven for testing grid thermostats**

It is impossible to give any definite instructions regarding the amount of maintenance work necessary to keep a chain of automatic substations in the proper operating condition, as the quantity of the work is entirely dependent upon the severity of service to which the equipment is subjected and also upon the local conditions regarding dirt, dust, dampness, etc. However, it will be found after six or eight months' experience in caring for a chain of automatic stations just how much individual maintenance each station will require and a schedule may be arranged accordingly.

In addition to the regular maintenance work consisting of inspecting, cleaning and blowing out, there is also a




**At left, direct current volt-ammeter. At right, triple-scale alternating current voltmeter**

certain amount of routine testing and inspection that should be laid out and followed carefully over each year's period of operation. This type of work consists of testing and calibrating the various protective devices and maintaining and inspecting bearings and testing transformer oil. A sample schedule for work of this kind is given herewith, and while it must be understood that this schedule will not apply to all installations it nevertheless can be used as a basis for a testing program.

## Detail Inspection of Rotary Substations

.....Automatic Substation Date.....
Inspection Started.....A.M. Inspection Finished.....P.M.
No. 1 *Master Element D.C. Undervoltage Relay.* Contacts.....Mech. Oper. .....Fuse Unblown.....
No. 2 *Time Delay Starting Relay.* Contacts .....
Mech. Oper. .....Time Setting.....
No. 3 *Master Relay.* Series Resistors.....
Mech. Oper. .....Contacts.....
No. 4 *Master Contactor or Controller.* Contacts.....
Mech. Oper. .....
No. 6 *Starting Contactor.* Main contacts are.....
Mech. Oper. .....Interlock contacts are.....
Interlock bind.....Lubrication of Interlock.....
No. 6X *Starting Contactor Control Relay.* Contacts.....
Mech. Oper. .....
No. 7 *Polarized Motor Relay.* Contacts "A".....
Contacts "B".....Contacts "D".....
Mech. Oper. spin motor and rotate drum.....
Lubrication, gears and bearings.....
No. 7X *Polarized Motor Auxiliary Relay.* Contacts.....
Mech. Oper. .....
No. 9 *Field Reversing Relay.* Contacts.....Mech. Oper.....
No. 12 *Overspeed Limit Device.* Does device shut station down .....Contacts.....Mechanical Operation.....
No. 28 *Resistor Thermal Relay.* Contacts.....Mech. Oper.....
Do contacts reset properly..Does relay operate properly..
No. 30 *Annunciator Lockout Relay.* Contacts.....
Targets .....Mech. Oper. .....
No. 32 *D.C. Reverse Current Relay.* Mechanical Operation.....
Contacts .....Does relay shut station down.....
No. 35 *Brush Lifting Device.* Contacts.....Contactor.....
Do they make and break properly.....Do they lift and seat properly.....Oil in gear case.....
Grease on exposed gears .....
No. 37 *Undercurrent Relay.* Drop out valve (approx.).....
Contacts .....Mech. Oper. .....
No. 38 *Bearing Thermal Relay.* Do contacts lockout station .....Mech. Oper. .....
No. 40 *A.C. Machine Field Relay.* Contacts....Mech. Oper....
No. 41 *Field Contactor.* Upper contacts.....Lower contacts .....Mech. Oper .....
No. 42 *Running Contactor.* Main contacts are.....
Interlock contacts are.....Interlock bind.....
Lubrication of Interlock.....Mech. Oper. .....
No. 42X *Running Contactor Control Relay.* Contacts.....
Mech. Oper. .....
No. 46 *Reverse Phase or Phase Balance Current Relays.* Contacts.....Do relays shut station down while in normal running position.....Does relay lockout the station if it operates while machine is starting.....
No. 47 *Single or Reverse Phase Voltage Relay.* Mechanical Operation.....Will phase failure operate relay. (Remove pot. tranf. fuses).....
Does relay shut station down.....Contacts.....
No. 49 *A.C. Thermal Relay.* Does relay shut station down.....
Mechanical Operation.....Contacts .....
No. 51 *A.C. Overcurrent Relays.* Do relays lockout the station .....Contacts .....Mechanical Operation.....
No. 52 *Oil Circuit Breaker and Mechanism.* Oil tested.....
Oil level .....Main contacts clear.....
Make good contact.....Do auxiliary switches make and break correctly.....Low volt. mech. .....
No. 62 *Time Delay Stopping Relay.* Contacts "S".....
Contacts "T".....Mech. Oper. spin motor and rotate drum .....Lubrication.....
No. 71 *D.C. Emergency Circuit Breaker.* Contacts.....
Mech. Oper. .....
No. 71Z *Flashover Relays.* Do contacts lockout station.....
Mech. Oper. .....
No. 72 *D.C. Contactors.* Contacts.....Mech. Oper.....
No. 73 *Load Limiting Resistor Shunting Contactors.* Contacts .....Mech. Oper. .....
No. 76 *Overcurrent Relays.* Contacts.....Mech. Oper. .....
No. —— *Synchronous Converter.* Pilot Brushes.....
A.C. Brushes.....D.C. Brushes.....Commutator .....Commutation.....Slip Rings .....
Bearings.....Connections.....Is machine clean.....
No. —— *Power Transformers.* Oil clear.....Level correct.....Connections .....
No. —— *Operating Transformers.* Oil clear.....Level correct.....Connections .....Fuses.....
No. —— *Potential Transformers.* Connections tight...Fuses....
No. —— *Current Transformers.* Connections tight.....
No. 150 *Short Circuit Selective Relay* (Title for both 150 & 150Y). Contacts.....Mech. Oper. .....
No. 150Y *Arc Bearings Free.* Contacts.....Mech. Oper.....
No. 172 *Feeder Contactor.* Contacts .....
Mech. Oper. .....Interlocks .....
No. 172X *Feeder Contactor, Auxiliary Relay.* Contacts.....
Mech. Oper. .....
No. 172Y *Feeder Contactor, Auxiliary Relay.* Contacts.....
Mech. Oper. .....
No. 182 *D.C. Reclosing Relay.* Contacts.....Mech. Oper.....
No. 182X *D.C. Reclosing Relay, Auxiliary Relay.* Contacts.....
Mech. Oper. .....

### Schedule for Routine Testing and Inspection

*D.C. Reverse Current Relays, A.C. Reverse Power and Machine Overspeed.*—Test and calibrate every six months.

*D.C. Overload, A.C. Reverse Phase and Low Voltage.*—Test and calibrate every six months.

*Bearings of Converters and Auxiliary Rotating Equipment.*—Change oil and flush reservoirs every six months. Take out and inspect converter and motor generator, set bearings once a year and touch up spots that show signs of slipping or cutting.

*Transformer Oil.*—Samples of oil from the oil insulated transformers should be taken every six months and tested for dielectric strength by actual test with an oil testing transformer. If the oil tests are low it should either be changed at once or else run through a dehydrating machine.

*Oil in Oil Breakers.*—The amount of attention which the oil breakers in a station require is solely dependent upon the number of operations per day and the severity of the loads which they interrupt. For that reason no hard and fast rule can be applied to the number of inspections required. In general, however, the oil should be changed and the contacts inspected and adjusted every three to six months. In case the breaker does not perform very many operations it is often possible to extend this period considerably but this can be proved only by experience.

*Thermostats, Grid Resistance and Bearing.*—Bearing thermostats since they operate around 100 deg. C. are tested very easily by placing them in a deep pot of oil heated by a Bunsen burner or tinner's furnace. Grid thermostats, however, present a different problem as their operating temperature is usually around 300 deg. C. This prohibits the use of oil as it will boil below that temperature. However, a very inexpensive furnace for testing these thermostats may be made similar to that shown in Fig. 2.

This oven consists merely of a heavy sheet iron cone lined with asbestos and designed to fit over the top of an ordinary tinner's stove. Suspended from the closed top of this cone is another sheet iron cone of smaller dimensions which forms a chamber for heating up the bulb of the grid thermostat and at the same time keeps it away from the direct flame of the tinner's stove. Small openings are left in the outside cone to carry away the flame and gases. The inner chamber maintains practically an even temperature all over so that readings obtained from the thermometer will be equivalent to the temperature to which the grid thermostat bulb is subjected. The grid thermostats and bearing thermostats are probably the most abused of any of the protective devices in an automatic substation, in that, due to the difficulty in testing them, inspectors and maintenance men often allow them to remain in an improperly calibrated condition without ever being aware that they are out of calibration. For this reason they should be tested at least every six months in order to insure the safeguarding of the machine bearings and the load-limiting resistors.

*Feeder Resistance Measuring Relays.*—In most applications it is sufficient to check the calibration of these relays every six months. This work is commonly done by the use of a resistance capable of carrying the measuring current and equal to the resistance of the load upon which it is desired to reclose.

The remaining protective devices can be checked during the general inspection and clean-up period and no special time for this work is necessary.

Insulation tests should be made on the station equipment every six months. By insulation test it is meant that all control wiring, all high-tension bus work, and all electrical apparatus should be subjected to an insulation test with a megger. In addition, on all 600-volt installations the switchboard risers and supports should be tested for grounds and also for potential. The same applies to the cast-iron framework which supports the grid resistors. Occasionally a bank of grid resistors will be found which has broken down its insulation and has placed potential on the cast-iron end frames. This condition is very dangerous as workmen may accidentally ground these end frames and cause a bad burn-out.

The subjecting of the control wiring to an insulation test often discloses some peculiar condition which would not have been discovered except through the medium of serious trouble. The use of a megger on the control wiring will often disclose minor grounds caused by collections of copper and carbon along wiring and equipment which in its present state could cause no trouble but might at some future time develop into an arcing ground

or short which would cause serious damage. When these faults in control wiring show up an elimination process should be started by taking off connections and progressing slowly down the control wiring until the fault is located. This can be accomplished by following the schematic diagram and checking off the points as they are disconnected and cleared.

It is essential that the inspectors and maintenance men be supplied with the proper instruments if they are to find troubles quickly and adjust the various relays properly. For this purpose a set of meters similar to those shown are useful. These meters are very compact and may readily be carried in a small leather carrying case. One is a d.c. volt-ammeter with the following ranges: 0-15, 0-150 volts with external resistor for 600 volts, and 0-3, 0-15 amp. The other is a triple scale a.c. voltmeter 0-150, 0-300 and 0-600 a.c. volts. Instruments of this kind can be carried easily from station to station and will always be available for testing and inspection work. Furthermore, the fact that the maintenance men have these instruments available will lead them to investigate immediately any condition which may not seem exactly right to them, while if it is necessary to secure the proper instruments from headquarters the chances are that it will be postponed until forgotten.

Automatic substation maintenance should be judged not so much by the quantity as by the quality of the work. The maintenance man who understands his station perfectly and understands the characteristics of each individual relay will discover troubles while cleaning up the station that the average maintenance man will pass over without notice. With this in mind all available literature concerning the stations should be turned over to the maintenance men and frequent meetings held in which maintenance problems and methods are discussed. By bringing up new problems and new phases of the work in these meetings the men will be prevented from falling into that routine rut which transforms maintenance men from a state of creative and constructive thinking into a condition where they turn out the routine work mechanically. This condition is obtained through doing the same work day in and day out without learning anything new about the equipment or having any reason to think deeply about its operation.

# Line Truck Increases Maintenance Efficiency

IMPROVED working conditions and increased efficiency in city overhead maintenance have resulted from the use of a line truck in place of line cars on the city lines of the Chicago, North Shore & Milwaukee Railroad, Chicago, Ill. After experimenting for some time it was found that much of the city overhead maintenance could be performed during the daytime by the use of a line truck, whereas the line cars must work at night under poor working conditions.

The city systems of this railroad are equipped with direct suspension overhead trolleys while a combination of both simple and compound catenary and direct suspension is used on the interurban system. For work on the interurban system, as well as the city system, the truck is fitted for maintenance and renewal of poles and fixtures, and the stringing of small wire.

The choice of truck chassis and style of body was determined by the type of work and territory to be covered. A 2-ton, 168-in. wheelbase truck with 5-in. single-cushion tires in the front and 5-in. dual-cushion tires in the rear is used. The truck body, exclusive of the cab, is 12-ft. long and 6-ft. wide, and stands 9 ft. above the ground. The truck body contains a number of compartments for rope, chain, line tools and repair parts. The upper side frames and the rear of the truck



The truck body contains a number of roomy compartments for line tools and repair parts

are covered with durable canvas curtains. Several crossbars near the roof of the body provide an out-of-the-way place for extension ladders and other cumbersome equipment.

The tower, which is a manufactured product, is a three-section, heavy-duty type with an insulated platform 56x66 in., provided with a 3 ft. collapsible pipe railing. The tower may be raised to a height of 20 ft. by a hand-operated winch. When collapsed, the total height is approximately 10 ft.



A light metal framework on the platform folds flat when the tower is not in use

# *Modern Practices in*

# Lubrication of Electric Railway Equipment

**By H. L. Kauffman**
Denver, Col.

*In an article published in the Oct. 20, 1928, issue, the writer discussed the kinds and grades of lubricants suitable for use on electric railway equipment, hints on the selection of the waste used, how to saturate the waste with oil and modern practice in packing the "down-feed" motor. In this second article information is given on the lubrication of motors of recent design, on modern bearing oiling devices, and causes of bearing lubrication troubles.*

IN THE so-called modern type motor there is overcome, from the lubricating viewpoint, all the inherent disadvantages of the "down-feed" motor. In this type of motor a waste well is provided with an opening in the bearing lining through which oil from the waste can reach the bearing. Adjacent to the waste well is an oil well, the two being connected by a hole at the bottom of the partition wall. In late designs the division wall between the wells is slotted throughout its length. This eliminates the possibility of closing the bottom hole with dirt or other foreign matter.

The auxiliary oil well is provided for replenishing the oil supply and for gaging its depth. This well is used when renewing the oil supply, since it conducts the oil to the bottom, from which point the capillarity of the waste is depended upon to raise the oil to the bearing. This arrangement gives a more uniform oil feed and also avoids the introduction of dirt to the bearing surface. The rate of feed is influenced largely by the viscosity of the oil—the higher the viscosity, the lower the feed rate. It is very important that the grade of oil be changed with a change in the seasons, since the viscosity of car oil varies with temperature.

Before opening the cover to pack a bearing, all dirt that might fall into the bearing housing should be removed. Long-fiber all-wool yarn, being of a springy nature even after it is saturated with hot oil, is the most desirable bearing packing now obtainable. The individual pieces of yarn should be at least 12 in. long. Since the oil will climb up straight strands of the packing yarn faster than it will pass through a number of balls or wads of the packing, it is desirable that the packing be in the form of a wick in the housing and the larger the wick, the easier it will be for the oil to reach the shaft.

The pieces of packing required for the wicks for the armature bearings should be made into skein forms of sufficient length to reach from the bottom of the waste chamber up to about 6 in. above the seat for the waste chamber cover. The skeins should then be twisted about one complete turn to hold all of the strands of yarn in place and to produce a more springy wick. As many skeins as possible are packed in the waste chamber, starting at the inner end of the bearing and working outward, and allowing the upper ends of the skeins to hang out over the seat of the cover about 6 in., or enough to hold them in place.

After the wick is formed in the chamber it should be pressed over horizontally, tight against the shaft, by means of a suitable packing iron and held in place by forcing the necessary additional packing behind it. The loose upper ends of the skeins of the wick should then be folded over the other waste and tamped down tightly. Waste chambers of the axle caps should be packed in the same way as those for armature bearings. A pad of the saturated waste, large enough to fill the remainder of the waste chamber, should be placed on top of the wick to catch and hold dirt which might fall in when the bearing housing cover is opened.

When the motors are new particular care should be taken to provide the bearings with plenty of oil, but care should be taken not to flood the motor. After the motors have been "broken in" it is desirable to inspect the bearings for oil depths about every 1,200 to 1,500 miles, but the frequency of inspection depends upon the character of service and general conditions of track and equipment.

On some types of cars it is necessary for the oiler to pack the motors by feeling rather than by sight, due to the bearings being located under and close to the car floor rather than under the floor traps. In such instances, extreme care must be taken to prevent the waste from touching dirty parts of the car under the floor and so introduce dirt into the bearing.

The frame heads are provided with auxiliary oil wells for gaging and for adding oil. The maximum oil level in the bearing pocket should not be above a point $\frac{1}{2}$ in. below the lower edge of the opening in the oil box casting. The minimum depth of oil should not be less than 1 in., depending on the shape and size of the waste pocket. The bearings should not be filled above the maximum depth recommended by the manufacturer or they may be flooded and the oil wasted. The supply of oil should be replenished by the time the minimum depth has been reached or the bearing may run hot. Until the amount of oil required has been determined, the depth should be gaged each day. Measurement can be made

by means of a stick or rule placed in the auxiliary oil chambers.

If oil be added to a height above that recommended by the manufacturer, the feed to the bearing is too fast to be economical; further, it may be the cause of short circuits due to the throwing of oil on the commutator. Too low an oil level reduces the rate of feed below that required for satisfactory lubrication. The higher the lift required of the waste, the less oil it will raise. C. Bethel, in an article on packing railway motor bearings, published in the April 19, 1928, issue, states that on a 40-hp. motor, about 2½ grams of oil are fed per hour with a ½-in. lift, this dropping to 1½ grams per hour when the lift is increased to 1 in. and to ⅛ of a gram per hour with a 3-in. lift. This latter rate is considered a minimum for good lubrication.

On most railway motors of recent design, near the ends of the armature shaft just inside the bearing lining flanges are the thrust collars on which are mounted a series of oil deflectors. The oil that works past the face of the flanges is caught by these deflectors and thrown into grooves in the frame heads, whence it is conducted to drip pockets beneath the bearing. Waste should be kept in the drip pocket to absorb the excess oil. Care should be taken to repack the pocket with dry waste when old waste has become saturated. This is to prevent oil from running out of the pocket possibly entering the motor. Oil should not appear inside the motor, especially on the commutator.

The consumption of oil depends on the mileage made, the condition of the bearings and the severity of the service. The frequency of inspection can be determined best by experience on a particular line, keeping in mind that new equipment should always have careful attention. Most companies find inspection to be necessary at intervals of from ten days to three weeks. A few drops of oil may save many times their cost in babbitt at a critical time. The packing should be turned over occasionally and particular care taken to see that the lining flanges are lubricated properly. Boxes of "down-feed" motors require reoiling more frequently than do those of motors of the modern type, sometimes as often as after each 300 miles of service; in other cases, as frequently as every other day. This period can be extended and better lubrication obtained by the application of the "Rico" type oiler.

The "Rico" type of vacuum oiler was described in Electric Railway Journal for Oct. 29, 1921, on page 781. With this type, oil is fed to the bearing by means of a feeder wick acting alternately under the influence of capillarity and gravity. The principle employed results in supplying oil to the bearing at rates commensurate with the temperatures at which the bearing operates. This is accomplished automatically by means of the compensator. This feature is important.

The advantages of the "Rico" vacuum oiler can be summed up as follows: (1) The oil supply is contained in a sealed reservoir where no dirt, water or other foreign matter can get to it; (2) the conveyance of oil to the bearing is by the dependable action of gravity; (3) that portion of the waste in contact with the shaft or axle is always well saturated with oil; (4) the lubricating system is automatic, and (5) the lubrication film is always maintained between the bearing surfaces.

In the various types of oil-sealed housings, the oil level in the waste well is kept constant by means of an automatic feed such as that of a "chicken trough." This housing provides a large oil-reservoir and keeps out dirt.

With certain types of axle caps and armature housings, where the caps and housings are not worn to the extent requiring replacement, a method has been developed of properly reforming the waste and oil chambers, by the use of a special plastic compound, for conversion to a semi-top feed principle of lubrication, effecting a path for the flow of oil from the oiler directly to the bearing.

The compound consists of a "special" powder which is mixed into a plastic form by a solution of water and flake magnesium chloride. It can be applied readily to the interior of the waste compartments and can be formed by troweling to the proper contours. The mixture requires about 24 hours to harden firmly, after which it is not affected by oil or water, and will not chip or crack. By the use of this method the size of the oil window is reduced greatly, thereby increasing the bearing surface and reducing bearing breakage.

### Causes of Bearing Lubrication Troubles

Proper and efficient bearing lubrication begins with the machining and grooving of the bearings. All edges must be chamfered, both to prevent scraping of the oil film and to permit of oil distribution that otherwise would be impossible. Excessive grooving increases unit pressure and results in rapid wear.

So-called bearing lubrication troubles, upon investigation, are usually found to be due to some mechanical difficulty—assuming the use of the correct grade of a suitable oil and proper saturation of the waste. For example, misalignment in reboring housings or insufficient end play may cause apparent lubrication failures. Or, the trouble may be due to such conditions as the following:

1. Distorted bearings, which are caused by forcing a bearing with too tight a fit into the housing. This condition can be guarded against by being sure that the motor turns over by hand after assembling.
2. Shifting of the bearings in the housing, caused by shearing of dowels or keys. This will prevent the window in the bearing from registering with the window in the waste well, thus shutting off the feed of oil.
3. Loose or stretched housing bolts on the split-type motors. Such a condition is the cause of a poor fit between the bearing and the housing, as a result of which the oil is permitted to escape outside the housing. Misuse of shims gives this same effect.
4. Presence of water in the waste. This may either wash the oil out of the waste or cause waste glazing, or both, depending upon the amount of water present therein.
5. Armature striking pole pieces, due to worn bearings. The life of motor and axle bearings ranges from 50,000 to 250,000 miles. For a maximum length of service it is essential that these bearings receive a sufficient and continuous supply of lubricant; that they be packed and fitted to exclude dirt and water; that they be well and properly machined on all surfaces; and that temperature changes in the bearings due to electric heating be reduced to a minimum. Under ordinary circumstances, motor bearings should be removed when the radial wear is $\frac{1}{16}$ in. to $\frac{3}{32}$ in., or when the air gap is reduced to $\frac{1}{64}$ in.

Axle-bearing wear is apt to be just as harmful as armature bearing wear, since the detrimental effects of excessive clearances are not noticed so quickly in the former as in the latter. Excessive clearances in the axle bearing cause shocks and unnecessary strains in the motor frame and in the axle caps and axle-cap bolts. Also the center to center distance between the axle and the motor shaft is increased. In consequence of this spreading of the gears, the gears and pinions rub instead of roll, and naturally, excessive wear of these parts results. Clearances should be limited to ⅛ in., though under no conditions should uneven wear of the two axle bearings be tolerated. Close attention to these bearing fits will reduce trouble in service.

# *Go After a Prize in*

## Help Your Company to Win Maintenance Trophy to be Awarded at Next A.E.R.A. Convention

## Individual Cash Prize of $200 Offered for Best Maintenance Idea of the Year

## Twelve Cash Prizes to be Distributed Among Maintenance Men in Various Departments

IN ANSWER to an industry-wide expression of appreciation of the value of ELECTRIC RAILWAY JOURNAL'S maintenance contest conducted in 1927 and extended in 1928, a new series of prizes and a bigger and broader contest have been arranged through the co-operation of the American Electric Railway Association and the committee of judges, for the purpose of stimulating increased recognition of the work of the maintenance man, and raising the standards of maintenance in the local transportation industry.

ALL entries are to be made in the form of short articles describing briefly methods or devices that improve maintenance practice. These will be judged on the idea presented and its adaptability to the maintenance work of local transportation companies. Special writing ability is not necessary. It is the intention to make the prizes available to men engaged in practical maintenance work. The form of presentation will be judged only as to the clearness with which the method or device is described and illustrated, and the extent to which information is given which would be needed by other properties interested in using the idea.

THE opportunities for individual men to win cash prizes include both the capital prize of $200 and the twelve departmental prizes. The departmental prizes will be divided into three groups, as follows: (1) Four prizes of $25 each to be awarded for the best maintenance idea submitted before Jan. 15, 1929, from each of the four departments mentioned, namely, rolling stock and shops, way and structures, electrical and line, buses and garage. (2) Four prizes of $25 each for the best items submitted between Jan. 15, 1929, and April 15, 1929, divided between the four departments as before. (3) Four prizes of $25 each for the best items submitted from April 15, 1929, to July 15, 1929. Announcement of the winners of these departmental prizes will be made

## *Rules of the Contest—*

**1** The contest will be judged and the prizes awarded by a committee of the American Electric Railway Engineering Association consisting of A. T. Clark, superintendent of rolling stock and shops United Railways & Electric Company of Baltimore, chairman; Howard H. George, superintendent of research Cleveland Railway; F. McVittie, electrical engineer New York State Railways, Rochester, N. Y.; G. C. Hecker, special engineer American Electric Railway Association; Charles Gordon, editor *Electric Railway Journal*. All decisions of the judges in interpreting the conditions of the contest and in making awards will be final.

**2** Any employee or official of an operating electric railway or bus company may compete for the prizes.

**3** Each contestant may submit any number of items he desires, each of which will be judged separately. An individual may win several of the prizes.

**4** The author does not necessarily have to be the originator of the idea, but it must be adopted and be in use on the property with which he is connected. The idea submitted may have originated on another property or may have been furnished by a manufacturer. No device or method a description of which, to the knowledge of the contestant or the judges, has been previously published will be eligible for this competition.

**5** The competition is not limited to those who originated or developed the idea or apparatus described. Any employee, with the approval of the department head concerned, may submit a maintenance practice or device used on his property. More than one article covering the same device or method will not be accepted, however.

**6** Where the management of a railway has a practice of requiring approval of articles sent out for publication such approval must accompany the manuscript. If written approval does not accompany the manuscript it will be assumed that such approval is unnecessary.

**7** An article may be submitted by several persons or by a department, and need not be written by the person in whose name it is submitted. The prize will be awarded to the individual or department whose name appears on the manuscript, and may be distributed among the winners on any basis they may desire. Should there be a tie for any prize the full amount will be awarded for each of the articles involved in the tie.

**8** Articles may describe any maintenance practice or device used by any department of a railway such as the maintenance of rolling stock, buses, shop equipment or methods and equipment for overhead line repairs, power distribution and power generation devices, signal work, track and way maintenance, etc. Unless manuscript submitted is marked to indicate the department to which it is to be credited, the judges will

# *the New* Maintenance Contest

READ the conditions of this new and bigger maintenance contest. Any employee or official of an electric railway or bus operating company may compete. No limit on number of items that can be submitted. Don't delay getting started. Winning company, department and individual to be honored at next convention.

## READ CAREFULLY

determine the classification under the following divisions: (1) rolling stock and shops; (2) way and structures; (3) electrical and line; (4) buses and garage.

9 Articles submitted for these prizes should be preferably 100 to 200 words in length and should be accompanied by one illustration. Brevity consistent with a proper presentation of necessary information will be given weight in judging articles. In no event should they be longer than 400 words with not more than two illustrations. Articles will be published as promptly as space permits.

10 In rating the various articles the committee will consider the primary value of the method or device as of highest importance. The committee will also consider its practicability, the advantages and economies that are set forth and the clearness and completeness with which the idea is presented.

11 The original manuscript and illustrations will be turned over to the committee of judges for making all awards. These may, however, be published before or after prizes are awarded.

12 All articles must be in the English language and be mailed to the editor of *Electric Railway Journal*, Tenth Avenue and 36th Street, New York City. Items to be eligible for the first group of departmental prizes must bear a postmark not later than midnight, Jan. 15, 1929; for the second group not later than April 15, 1929; for the third group not later than July 15, 1929. All material bearing a postmark not later than midnight, Aug. 17, 1929, will be eligible for individual cash capital prize, company trophy award and departmental certificates of merit.

13 The announcement of winners of departmental prizes will be made in the issue of *Electric Railway Journal* devoted to maintenance and construction (the third issue each month) in the month following the closing date for each group of departmental prizes. Winners of the company trophy, individual capital cash prize and special departmental certificates of merit will be announced, and awards made, at the 1929 annual convention of the American Electric Railway Engineering Association.

14 Any material submitted may be published at any time after its receipt that the editors of *Electric Railway Journal* decide.

15 All articles submitted will become the property of *Electric Railway Journal* and no manuscripts will be returned.

16 A minimum of $5 will be paid for each item published.

Additional copies of these rules and full details of the contest may be obtained upon application to ELECTRIC RAILWAY JOURNAL or the American Electric Railway Association.

in the regular maintenance issues of the JOURNAL following each closing date. The annual cash prize of $200 will be awarded at the convention for the best single item submitted in the contest.

AS STATED in the rules, an annual company maintenance trophy will be awarded at the convention to the company making the greatest contribution to the improvement of maintenance practice through participation in this contest. In determining the winning company, the judges will consider: the total number of items submitted by employees or officials of a given company; extent to which each of the four maintenance divisions are represented in the items submitted; number of individual departmental prizes won; relative merit of all material submitted; extent to which the ideas presented are applicable to other properties; value to the industry of the maintenance ideas made available through participation of employees or officials in this contest. In addition, special certificates of merit will be presented to each department making the best individual showing.

### GENERAL INSTRUCTIONS

WRITE on one side of the paper only. Have your article typed if possible, but manuscript written long hand will be accepted. Write the article as though you were writing a letter to another maintenance man giving him your experience with a new method or device. "Fine writing" is not necessary. Give merely the facts and a description of the device or method. Include data on cost savings effected whenever possible.

Envelope and manuscript should be marked "Maintenance Competition." Any number of items may be sent in the same envelope. The Maintenance Data Sheet section of this issue contains items of the type desired.

# Centralized Control of Emergency Service

By Joe R. Ong,
*Transportation Engineer Cincinnati Street Railway, Cincinnati, Ohio*

*In this article, based on a paper presented at the semi-annual meeting of the Electric Railway Association of Equipment Men, Southern Properties, held recently at Cincinnati, the author describes the latest provisions in Cincinnati to insure prompt and adequate emergency service. Motor trucks have been substituted for the former trolley wrecking cars.*—Editor.

CONTROL of the Cincinnati Street Railway emergency service is centralized in a dispatcher's office, manned by three dispatchers, each on an eight-hour shift. By this arrangement the equipment is ready for calls during the full 24-hour period of operation.

At strategic points along the various routes the company keeps uniformed supervisors to direct car movements, report trouble and check running times. The latter are entered in a loose leaf form of supervisor's book so arranged that one double page covers an hourly period. Under the old rule, when the supervisors and car crews reported trouble, they called their own division carhouse, and a wrecking car was sent out if necessary. Under the present plan they call the dispatcher who has control of all emergency service.

The company's telephone system centers in a private branch exchange with trunk lines to the Bell telephone system. The dispatcher is located in a separate office in the transportation department and has one telephone line to the private branch exchange and one direct outside line with an individual number. Anyone calling the dispatcher from a city telephone may reach him on this direct wire, or, if the line is busy, he may be reached through the company's switchboard.

The dispatcher has continuously before him maps, schedules and other data relating to operation. When he receives a trouble call he determines what emergency service is required, from what point it shall be dispatched, and what supervisory officials are to be notified. All of his outgoing calls to carhouses and other points are made through the company's switchboard, and are handled by the regular operator in the same way as any other local call. With but few exceptions, the telephones in the boxes near the supervisors' stations are connected with the private branch exchange and are equipped with relays so that when the operator calls the exchange, the relay closes a five-light circuit on the trolley circuit as a signal to the supervisor that he is wanted.

There are nine operating divisions on the Cincinnati Street Railway system with a carhouse in each division. At five of these, selected for territorial location, motor trucks are stationed for emergency use. Four of these trucks are Fords with ½-ton open bodies, and one is a Dodge-Graham with a 1-ton open body. At a sixth location, just outside the congested area, there is another Dodge-Graham 1-ton truck for emergency service in the downtown section.

These emergency trucks are equipped with necessary tools, such as jacks, chains, blocking, etc. They are found much more effective than the wrecking car of former days as the trucks can more quickly reach the exact scene of the trouble.

The trucks at the carhouses are manned by regular carhouse employees capable of making emergency repairs on the road. This service is available 24 hours per day. At the sixth location near the congested area there is no carhouse. Here, each of the two men assigned to this truck is on a nine-hour shift to cover the eighteen-hour period during which operations are conducted. They have no other duties than to respond to calls.

In addition to these trucks there are two line trouble trucks at the headquarters of the line department near the central section of the city. A third line trouble truck is at one of the carhouses for service to the outlying districts. All line trouble trucks are manned by linemen and only those at headquarters can be used for other work between calls. Whenever a line crew or emergency crew clears trouble after a call, a member of the crew goes to the nearest convenient phone and reports to the dispatcher. Often this saves time in dispatching relief to another point.



**The emergency truck drawn up beside a street car permits the change of trolley poles to be effected with a minimum loss of time**

Through an arrangement with the fire department, there is a fire alarm indicator in the company's telephone switchboard room. When it indicates an alarm, the telephone operator calls the fire department, finds out the location of the fire and reports it to the dispatcher who, in turn, notifies supervisors and divisions likely to be affected. If the fire call is in the central business area, the dispatcher calls out both the line trouble truck and the emergency truck. The dispatcher's office serves as a clearing house for information for all of the officials of the company who may have occasion to find out what is going on at any particular time.

*Electric Railway Journal Maintenance Data Sheet*

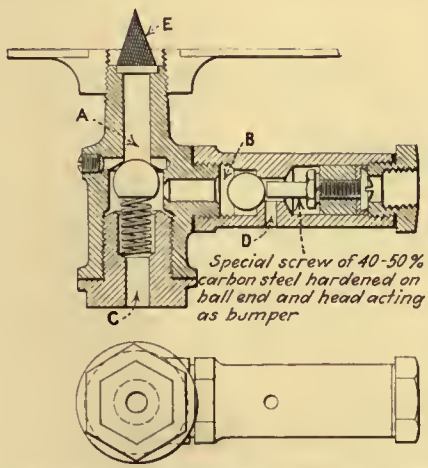
ROLLING STOCK—MISCELLANEOUS—43

# Automatic Drain Valve for Air Reservoirs*

By Harvey L. Bullock

*General Foreman of Electrical Equipment*
*New York Central Railroad*
*White Plains, N. Y.*

FOR ridding the air brake system of cars from water, a new valve mechanism has been installed on some of the cars of the New York Central Railroad. This mechanism operates automatically to remove the condensed water from the air reservoir and piping at all times. When the equipment is laid up and the compressor is cut off the valve opens at any predetermined pressure and closes when the compressor cuts in again. The mechanism also ejects the water accumulation in spurts as the compressor is cut in and out in regular service. This is done through the air compressor governor connected to operate the mechanism.




**Condensation draining device for air brake system of cars**

In the accompanying drawing there are two valves—a low pressure, and a high pressure valve. The low pressure valve is marked *A* and the high pressure valve, *B*. In the low pressure chamber a spring actuated ball valve opens when the pressure drops below 8 to 10 lb. Any water in the reservoir or piping then drains out of the opening *C*. In the high pressure chamber a single ball valve operates on two seats and is actuated back and forth by the intermittent pressure of the air compressor governor. At each movement of the ball any water accumulated in the system is ejected through the opening marked *D*. A strainer marked *E* keeps dirt out of the mechanism that might tend to cause trouble. All parts are of metal and are indestructible.

This mechanism has been tested out in service on multiple-unit cars for several years, and has been subjected to service in freezing temperatures, and found satisfactory. In addition to using the automatic drain valve for draining reservoirs of car equipment, it can be used on supply lines, air-operated switches, etc.

**Submitted in* Electric Railway Journal *Prize Contest.*

*Electric Railway Journal Maintenance Data Sheet*

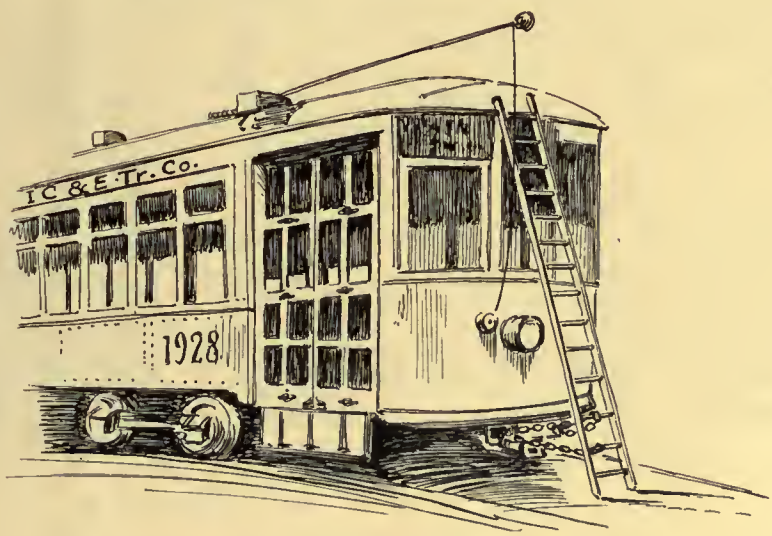
ROLLING STOCK—MISCELLANEOUS—45

# Safety Chain on Ladder*

By F. J. Foote

*Superintendent of Motive Power and Equipment Indiana, Columbus & Eastern Traction Company, Springfield, Ohio*

SAFETY chains are installed on ladders in the shops of the Indiana, Columbus & Eastern Traction Company in the manner shown in the accompanying sketch. Before adopting the chain method, spikes were tried on the ladder feet, also cork-lined pads, etc., but the chain was found to be the safest and most satisfactory. A light, strong steel chain about 10 ft. long is attached to the rung of the ladder at one end. The end of the chain is provided with a strong snap. The ladder is placed in the position desired and then the chain is thrown around a truss rod, truck frame or any convenient part. The slack is taken out and the end snapped into the nearest link of the chain.




**Safety chain as installed on ladder to prevent slipping**

**Submitted in* Electric Railway Journal *Prize Contest.*

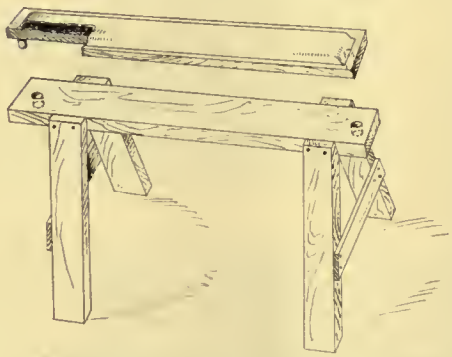
*Electric Railway Journal Maintenance Data Sheet*

ROLLING STOCK—MISCELLANEOUS—44

# Removable Trestle Pads*

By Farrell Tipton
*Electrician San Diego Electric Railway*
*San Diego, Cal.*

IN EVERY electric railway carpenter shop there is frequent need for padded trestles for supporting finished work such as street car and bus doors and windows. There is also much other work that is most conveniently supported on trestles but which is of such a character that pads are not needed. To provide a removable type of pad for standard trestles so that it is unnecessary to tie up a trestle for finished work only, the San Diego Electric Railway, San Diego, Cal., uses a comparatively simple method.



**Construction of trestle as used by the San Diego Electric Railway with removable padded face**

Standard sizes of trestles are used throughout the various departments of the shop, and where padding is necessary a board is cut of a length and width identical with the trestle face. One side of this board is padded and the opposite side is provided with two $\frac{3}{4}$-in. dowel pins. These are located 2 in. from either end, as shown in the accompanying illustration. The faces of the trestles are then drilled to receive the dowel pins. The padded board can be placed in position or be removed quickly by this arrangement.

*Submitted in Electric Railway Journal Prize Contest.

*Electric Railway Journal Maintenance Data Sheet*

ROLLING STOCK—MISCELLANEOUS—46

# Brake Adjustment Troubles Eliminated

BRILL 27-G trucks in use on the New York & Queens County Railway, Long Island City, N. Y., originally had turnbuckle brakeshoe adjusting rods. These caused considerable trouble in service as the threads became worn, permitting excessive motion between rod and turnbuckle. This wear finally sheared the turnbuckle cotterpins and caused a loss of the braking power. Troubles of this nature have been eliminated by a new design of adjusting mechanism adopted recently. It is shown in Fig. 1. This mechanism consists of two $2\frac{1}{2}$x$\frac{3}{4}$-in. flat bars riveted together and held $1\frac{1}{16}$ in. apart by pipe spacers. A number of $1\frac{1}{16}$-in. holes provide for shoe adjustment. The dead lever rack was also redesigned with a larger number of $\frac{3}{8}$-in adjusting holes to permit of obtaining a still finer shoe adjustment. This design is shown in Fig. 2.

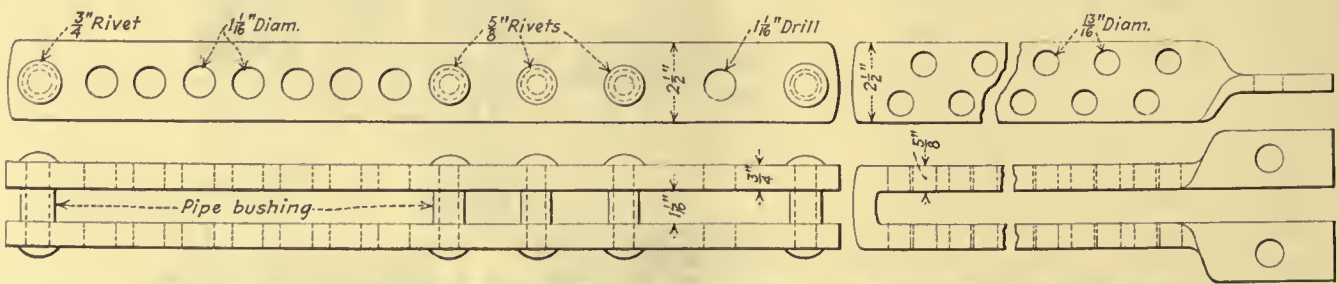



**Fig. 1 (At left)—Brake adjusting mechanism. Fig. 2 (At right)—Dead lever rack with adjusting holes**

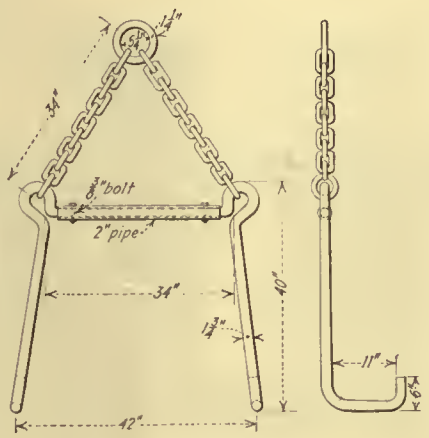
*Electric Railway Journal Maintenance Data Sheet*

ROLLING STOCK—MISCELLANEOUS—47

# Lifting Hook for Three Operations

WHEN a shop tool can be designed to serve many purposes the number and cost of the tools required and the cost of their maintenance can be reduced. This fact is considered of prime importance in the shop of the Staten Island Rapid Transit Railway, Staten Island, N. Y. It has been determined that the cost of the time involved in constantly changing the lifting tools to perform certain operations amounts to an appreciable sum at the end of a year. For this reason the hooks shown in the accompanying sketch were developed to accomplish three important operations. Motors are lifted from the truck, wheels are handled and trucks are raised.

The hooks are made from $1\frac{3}{4}$-in. round steel and are 42 in. between centers at the bottom and 34 in. at the top. The top corners are formed with the eye for supporting a $\frac{3}{4}$-in. lifting chain made of $1\frac{1}{4}$x$2\frac{1}{4}$-in. links. These chains are fastened to a ring made of $1\frac{1}{4}$-in. material which has an inside diameter of $5\frac{1}{4}$ in. To provide additional strength the top horizontal rod is placed inside a 2-in. pipe, the ends of which are in contact with the eye metal. It is held in place by two $\frac{1}{2}$-in. through bolts. The over-all height of this pair of hooks is 40 in. Each hook is 6 in. high and has an opening of 11 in. They have accomplished the purpose for which they were designed and not a single failure or accident of any kind has occurred in the company's shop since they have been placed in service.




This lifting hook can be used for several operations

*Electric Railway Journal Maintenance Data Sheet*

ROLLING STOCK—ELECTRICAL—59

# Pinions and Lugs Heated Electrically

FORMER methods of heating pinions for making a shrink fit on armature shafts have been displaced in the Chicago, Milwaukee, St. Paul & Pacific Railroad shops at Deer Lodge, Mont., by the induction heater illustrated. The heater consists of a closed core transformer with 160 turns of magnet wire on the primary consuming approximately 1,500 watts at 110 volts. The core is of laminated iron 4 in. square and has a removable section on which the gear is placed. When the primary of the transformer is energized with a gear in place as shown, the gear constitutes a short-circuited secondary winding of one turn, in which a heavy current circulates and produces rapid heating.

For a 45-lb. pinion about 25 minutes is required to bring the temperature to 312 deg., the proper temperature for the shrink fit. This method of heating is uniform and eliminates scale and other objectionable features of a forge or other methods of heating.

Another use for the transformer is for heating lugs with the carbon tipped holder, shown in one of the accompanying pictures. The current which is passed through the lug is obtained from the small coil shown on the right-hand leg of the transformer core. This coil contains twelve turns of No. 5 wire and produces 100 to 130 amp. at about eight volts. The lug heater has been found very handy in reaching into a motor to solder or unsolder a lug.



At left—A gear placed on the transformer becomes a short-circuited secondary and heats quickly

At right—Leads from a stepdown secondary coil facilitate the heating and soldering of lugs

*Electric Railway Journal Maintenance Data Sheet*

ROLLING STOCK—MISCELLANEOUS—18

# Simple Method of Straightening Trolley Poles*

By C. B. Hall
*Chief Clerk Mechanical Department Virginia Electric & Power Company, Norfolk, Va.*

STRAIGHTENING trolley poles is a comparatively simple task for the mechanical department of the Virginia Electric & Power Company at Norfolk, Va. One of the poles supporting overhead wires in the carhouse yards was drilled at a point approximately 3 ft. from the ground, the hole being large enough to accommodate any size of trolley pole. To withstand the pressures when poles are being straightened the hole was reinforced by bolting a ½x6x8-in. iron plate at each end. Greatest pressure for straightening necessarily comes at the ends of the hole and the iron plates take care of this.



**Straightening a trolley pole by inserting it in a hole and bearing downward**

The accompanying illustration shows a workman using the hole for straightening a pole. A 12-ft. 4-in. trolley pole has been inserted through the opening and the mechanic is exerting only a slight down pressure to restore it to its proper shape. The device is a big saver of time and labor.

**Submitted in* Electric Railway Journal *Prize Contest.*

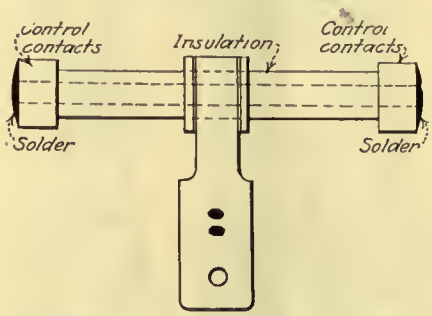
*Electric Railway Journal Maintenance Data Sheet*

ROLLING STOCK—ELECTRICAL—60

# Soldered Breaker Contacts Reduce Trouble*

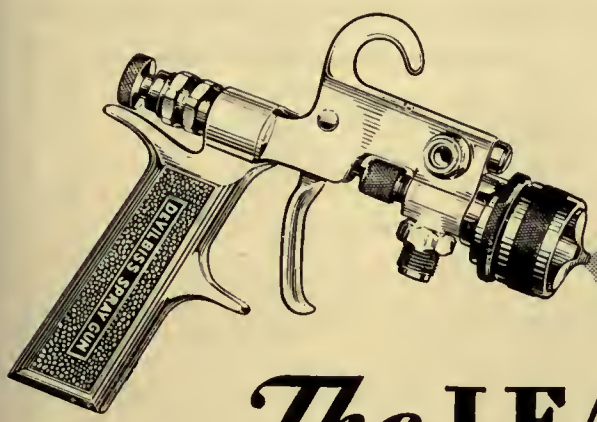
By H. J. Beadle
*Engineer of Equipment Dallas Railway and Terminal Company, Dallas, Tex.*

RECENTLY trouble was experienced on one of the cars of the Dallas Railway & Terminal Company, Dallas, Tex., when the line breaker refused to function. Careful investigation showed that the small round control contacts on the control handle, as shown in the accompanying diagram, were loose on the stem. The loosening was caused by the sliding and rolling action while closing. After the round contacts began rolling about the stem which holds them, the latter was worn very badly in a short time, and then poor contact developed. To overcome the difficulty the contacts were soldered to the stem. Since that time it has become standard practice to solder all contacts to the main stem, and the trouble has not occurred since.




**Soldered contacts overcome line breaker trouble**

**Submitted in* Electric Railway Journal *Prize Contest.*




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THERE are definite and valuable advantages to the electric railway operator in the fact that DeVilbiss leadership served at the introduction of spray painting and spray finishing into every industry and group now using this new and better method of applying protective and decorative coatings, and that DeVilbiss today offers the most recent new economies and efficiencies in all such operations.

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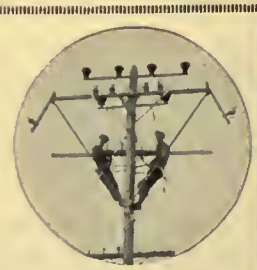
***Economy***—several companies using one pole reduces, to each, the cost of installation and maintenance.

*Write for details of why hundreds of railways and cities have adopted Elreco Tubular Steel Poles*

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Master equipment is fully described and the methods of handling live line work fully illustrated in Bulletin No. 3, copies of which will be sent to interested operating officials upon request.

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That because Elliott-Thompson coils are fashioned to fit they give full efficiency from the start, added wear, save time, labor and money.

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*Electric Railway Journal Maintenance Data Sheet*

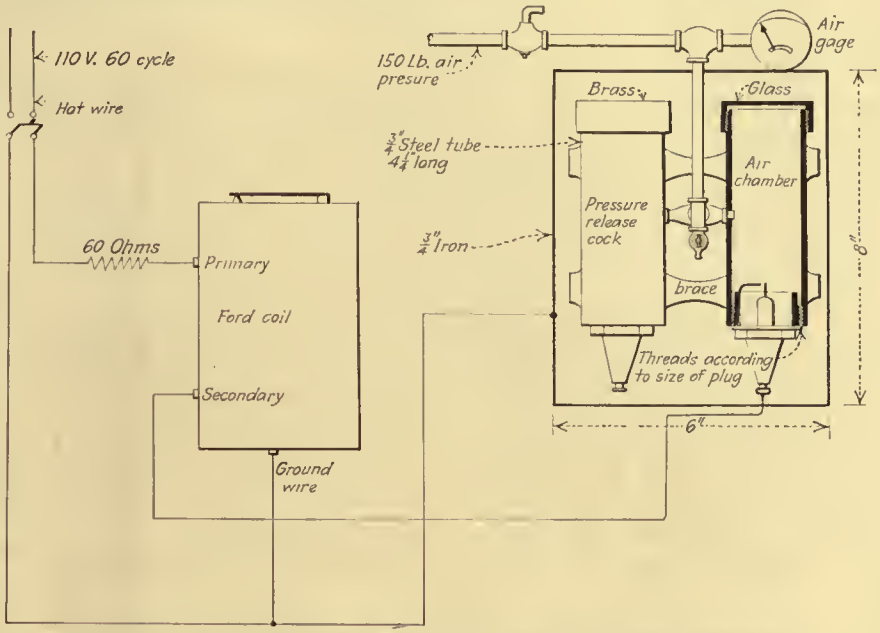
BUSES AND TRUCKS—18

# Testing Spark Plugs Under Pressure

By J. A. Doddridge
*Garage Foreman San Diego Electric Railway, San Diego, Cal.*

MANY spark plugs that will give a suitable spark under ordinary atmospheric conditions will not spark at all when submitted to a pressure corresponding to what they obtain in actual operation. To test spark plugs under pressure and to determine the pressure at which the spark begins to weaken, the San Diego Electric Railway has a special testing equipment in its garage. This consists of two cylinders, each having a glass top and provided with threads at the bottom into which can be screwed various types of spark plugs. These cylinders are connected to the shop air line which has a pressure of 150 lb. The electrical circuit of the spark plug is through an ordinary Ford coil. This has a switch so that when it is closed the coil will vibrate and the spark plug will function.

A shut-off valve is provided in the air line so that air can be admitted and the pressure built up in steps in the air chambers. It is found that some plugs will not operate at 50 lb. and others will fire at 150 lb. pressure. An air gage in the line shows the pressure at which the plugs break down. This tester has proved a great help in locating faults.




**Type of spark plug tester used by the San Diego Electric Railway**

*Electric Railway Journal Maintenance Data Sheet*

TRACK AND WAY DEPARTMENT—37

# Prolonging the Life of Plank Crossings*

By D. H. Walker
*Chief Engineer, Terre Haute, Indianapolis & Eastern Traction Company Indianapolis, Ind.*

IN AN effort to prolong the life of plank crossings now in place, and yet keep the surface smooth for vehicular traffic, the track forces of the Terre Haute, Indianapolis & Eastern Traction Company have found that good results can be obtained cheaply by the use of cut back asphalt.

The plank is given a thin coating of this asphalt and then sprinkled lightly with grit or sand. The resulting carpet forms a smoother surface and helps prevent rotting of the plank. The cost is but a few cents per yard. The accompanying illustration shows a crossing which was treated more than a year ago. Nothing has been done since. Although this crossing is used by about 2,000 vehicles daily, it is very smooth and shows no appreciable signs of wear.



**This plank crossing has been preserved by a thin coating of asphalt**

**Submitted in* Electric Railway Journal *Prize Contest.*

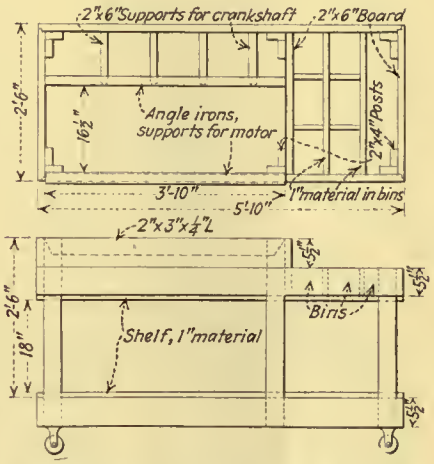
*Electric Railway Journal Maintenance Data Sheet*

BUSES AND TRUCKS—19

# Overhaul Rack for Bus Engines*

By C. B. Lain
*Engineer Mechanical Department*
*San Antonio Public Service Company*
*San Antonio, Tex.*

RACKS for storing parts of bus engines which are to be overhauled are used in the shops of the San Antonio Public Service Company. Each of the three in use consists of an upper and lower deck supported by six vertical members, and equipped with casters to make it portable. The upper deck is divided into compartments, one being arranged with cross supports to receive the crankshaft, one with parallel angle bars to support the engine block in a vertical position and seven compartments or bins to receive smaller engine parts such as carburetors, bolts, nuts, valves, etc. The lower deck has no divisions, and on it are stored the larger parts such as manifolds, crankcase pans, engine heads, generators, starters, etc.




**Overhaul rack for buses used by the San Antonio Public Service Company**

These racks cost approximately $30 each to construct. By keeping the parts together in an orderly manner a saving of three to six man-hours, or an average of $3.09 per engine, is made. Since no parts are lost and it is unnecessary to search through a mass of parts to find a particular one this saving will more than pay for the rack in one cycle of overhaul.

In addition to the advantages mentioned the use of the rack keeps all parts together so that the shop presents a more orderly appearance. The racks may be pushed to the most convenient place in the shop for doing the work, thus relieving crowding.

**Submitted in* Electric Railway Journal *Prize Contest.*

*Electric Railway Journal Maintenance Data Sheet*

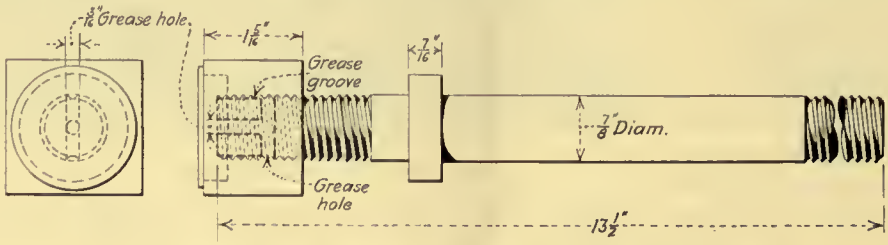
TRACK AND WAY DEPARTMENT—38

# Grease Cup Nut Prevents Rust*

By H. Erdis
*Switchman*
*Toronto Transportation Commission*
*Toronto, Canada*

IN MANY cases of broken switch tongues or switch tongue connector rods on the lines of the Toronto Transportation Commission, considerable time has been required to disconnect the rod from the switch tongue lug, due to formation of rust. To overcome this trouble a nut is now used with a grease chamber.

The accompanying sketch shows the construction of the nut. It is made large enough so that one side will be held from turning by the bottom of the tongue. The top is drilled out and a cap is welded on. This forms a recess which is filled with grease before the installation and when the connecting rod is screwed into the locked nut a certain amount of grease is forced around the thread through $\frac{3}{16}$-in. holes provided in the rod. With this arrangement the rod and nut remain coated with a film of grease or oil which effectively prevents the formation of rust. This in turn insures quick replacement.




**Grease cup nut as used on switch box connecting rods**

**Submitted in* Electric Railway Journal *Prize Contest.*

# Association Activities

## Popularize Transportation Through Better Maintenance

**Reducing railway and bus equipment maintenance costs without impairing service, securing good will and solving motor bus problems are principal subjects at Iowa convention**

DISCUSSION of both railway and bus maintenance problems was entered into heartily by the hundred or more delegates who attended the eleventh annual convention of the Iowa Electric Railway Association, Operators' Section, held at Cedar Rapids on Nov. 8 and 9. Although maintenance was the principal subject, other interesting papers were presented, including papers on urban transportation by public carriers, the motor bus in commercial transportation, efforts and results of manufacturers in popularizing electric railway and bus transportation, and the Iowa motor carrier law and its administration.

In his paper on the cleaning, painting and lubrication of cars and coaches, F. V. Skelley, superintendent of equipment Des Moines City Railway, called attention to the fact that while everyone admires a clean, well-ventilated street car, to gain this result requires a trained organization that knows how and when to sweep and clean. Let us take, for example, he said, a carbarn that houses 91 cars, 40 of which are regulars and the remainder trippers or extras. Here six men are classified as sweepers on an eight-hour basis and put in 75 per cent of their time at this work. As one man can sweep eighteen to twenty cars in eight hours, the average cost for this work would be about 20 cents per car. As cars are inspected on the 1,200-mile basis, said Mr. Skelley, we are sure of a well-cleaned car every six days. This weekly cleaning requires 45 minutes and costs 75 cents per car.

Buses and coaches are not washed on a mileage basis. They are swept, dusted and mopped on the inside every time they come in, and are washed on the outside only when they need it. This is not unusual, as some buses are on lines where it is very easy to keep them clean, while others such as specials require a thorough cleaning every time they come in.

The shop schedule calls for the complete overhauling and painting of two cars a week, added Mr. Skelley. City cars are painted every 24 months, and interurban cars and coaches when money is available. He gave the approximate cost for painting as follows: city cars, $125; interurban cars, $200; locomotives, $100; city buses, $76, and interurban coaches, $140. This work is handled in a paint room with a capacity for two cars and a working force of seven men, including a foreman.

Transferring his attention to the subject of lubrication, Mr. Skelley said that the armature bearings are the most vital parts of the truck to be lubricated, and with waste and oil well types of housings require tests every 1,200 miles. "We use no less than five grades of oils and greases on our buses," continued Mr. Skelley, "and the time and thought given to this subject have been worth while. During the past six months several oils have been tested and the results have varied from $1.04 to $2.83 per 1,000 bus-miles."

The main factors in the proper lubrication of a bus engine were summarized by Mr. Skelley as follows: (1) replenish oil frequently and fill crankcase to the level recommended by the manufacturers; (2) use only oil of the highest quality and proper viscosity; (3) keep the engine in as perfect operating condition as possible, and (4) test the oil drained from the crankcase for reclaiming.

### Maintaining the Electrical Equipment

Shop practices in connection with the maintenance and operation of electrical equipment was the subject of an exhaustive paper by Ben Dawson, electrician Cedar Rapids & Marion City Railway. The proper maintenance of every piece of electrical equipment for street cars was discussed in detail, particular attention being paid to the controllers and motors.

In speaking of controllers, Mr. Dawson gave the following advice: The care of controllers should be given to one person. If there are too many controllers to look after, prorate the work to more men. Internal cleanliness is essential. Keep out all dust, excess grease and oil. See that all fingers are set firmly and properly. Remove all worn-out fingers. File all burned segments and finger tips. Replace the bad ones. Most segments can be reversed; this prolongs the wearing life of the segments. Look carefully for free contacts on reverse drums. These fingers are easily caught and may be shoved back in case of reversal. Replace all pierced arc deflector plates at once. The main cylinder should be thoroughly cleaned at every car inspection. It is good practice to shellac the control drum twice a year. Examine carefully all wiring contacts at inspection time. Remedying a poor contact upon discovery may save a good deal of time and money for the company later on. Examine carefully the cut-out switches. See that they work freely and fit the switch jaws snugly in both the in and out positions. Use a good grade of petrolatum for the finger tips and segments. A good rule is to use a little at a time, but to use it often. Oil drum bearings once a month for good results. Eternal vigilance is the price of safety in the care of controllers, for no auxiliary on a street car is used more or abused more.

Electric railway motors should be capable of operating at scheduled speed under all loads, in all kinds of weather and for long hours of service, emphasized Mr. Dawson. They should be built for the most severe service conditions with long life and low upkeep characteristics. The most essential requisite in caring for railway motors is to lubricate them properly. No matter whether split, solid or roller bearings are used, proper and constant care is needed in the matter of lubrication.

James Thompson, superintendent of overhead construction Tri-City Railway, Davenport, outlined the procedure followed on his property in maintaining 94 miles of overhead with a crew of only two linemen, a groundman, a driver and a foreman. He called particular attention to the service record of a type of hanger designed by his own line department in 1906 and still in excellent condition.

### Variable Load Brake Equipment

"Introduction by electric railways of light-weight, relatively large capacity cars has brought braking problems not heretofore encountered" said J. S. Y. Fralich, district manager Westinghouse Air Brake Company, Chicago, Ill. This he attributed to the fact that single-truck cars frequently carry loads equal to the weight of the cars themselves and that many double-truck cars weighing approximately 30,000 lb. empty, weigh from 45,000 to 50,000 lb. when loaded with passengers. A wide variation between empty and loaded weights makes it impossible to provide suitable braking facilities under variable conditions of loading with the ordinary type of straight air brake equipment.

The speaker cited average brake design standards on electric railway straight air brake installations to show that under reservoir pressures varying from 50 to 65 lb. per square inch, braking ratios on empty, modern light-weight cars vary from 85 to 100 per cent with minimum reservoir pressure,

and from 110 to 130 per cent with maximum reservoir pressure. Even with these braking ratios which the speaker considered higher than necessary for empty car conditions, in some cases traffic distances are excessive when such a car is fully loaded.

It was because of this unsatisfactory braking that the Westinghouse Company developed its variable load brake, according to Mr. Fralich. This device, he explained, constitutes an automatically adjusted seat valve that is set for the brake pressure desired to meet the change in weight brought about by the variation from empty to full car loads. The speaker called attention to the importance of the equipment from the standpoint of safe operation and increased schedule speed.

### Popularizing Transportation

Summarizing the efforts of manufacturers to popularize electric railway and bus transportation, W. A. Clough, engineer General Electric Company, emphasized that transportation to be acceptable to people must be swift, safe and sure, and must embody comfort, convenience and class. Engineers have made it possible, continued Mr. Clough, to make schedules that were considered impossible a few years ago. They have learned to make materials do more work, have reduced weight with added strength, have made it possible to accelerate and retard street cars at rates hitherto considered impractical and have learned how to make the losses of the equipment do useful work in heating the cars.

To make transportation acceptable is still the problem of the engineer, but the artist and the salesman have to work alongside. The whims of human beings have to be considered, and as far back as classic times these whims have been recognized as fickle. Comfort, convenience and class have been introduced to the people by the bus and the public has declared in no uncertain terms that it will continue to demand these things. This change in the demands with regard to transportation has entirely upset the old ideas and methods used by transportation companies for many years.

It is safe to say, continued Mr. Clough, that no one really knows what kind of equipment, what kind of cars, what kind of buses they want to use. The entire industry is torn between an automotive street car and a street car bus, between rail and rubber. With all this confusion, with all the changing ideas of the operator and the public with regard to what they need, it seems of the greatest importance to the entire industry that transportation be made intelligible to the people. And people must be brought to realize that present-day conditions call for community rights rather than individual rights; that the thoroughfares and rights-of-way which are paid for by the people collectively, should be reserved and preserved for the use of the people collectively; that private conveyances should not have the right to monopolize the street, and that vehicles for public transportation should at all times have the right of way.

Specifically then, the task is to establish in the minds of the American people correct fundamental facts concerning transportation. Teach them what it means in time and energy to accelerate rapidly and brake rapidly, and to have the right-of-way unimpeded so that intermediate stops and slow-downs are not necessary, urged Mr. Clough, and it will not be difficult to secure ordinances and regulations that will favor community transportation.

Concluding, Mr. Clough asked the railway operators what they in turn had done to popularize their electric railway and bus transportation services. "Have you visualized your product as transportation or only as a street car ride? Have you used the tools available to you to the best advantage? Have you undertaken any research to find the underlying reasons for the change in the demands of the people? Have you educated your people to think correctly about this business of yours?" These things you must do, he declared, adding that railway men and manufacturers need a better understanding of their mutual problems to the end that the public may be better served and the transportation industry be made more prosperous.

### Problems of the Motor Bus

L. A. Rossman of the Northland Transportation Company, St. Paul, Minn., in his paper on "The Motor Bus and Commercial Transportation," told of the development of his company and its relation with the parent company, the Great Northern Railway. As one of the leading problems of the motor bus industry Mr. Rossman mentioned that of income. Too many motor bus lines pay well in summer and operate at a loss in other months, he stated. The returns of the good season are eaten up by the months of losing operations. To overcome this situation, a motor bus enterprise must have diversification. Some of the service must be rendered to sections in which there is winter traffic.

Economy in motor bus operations is essential but a low operating cost is not necessarily a measure of success, according to Mr. Rossman. Some motor bus operators should spend more than they do. It is a question as to whether or not an expenditure of an additional cent for developing business, another penny for better equipment and another penny for a better man behind the wheel, might not bring larger patronage and larger net earnings. The great progress in the motor bus industry in the coming few years will not be so much in the lowered costs as in fair costs, larger incomes and greater net returns. The speaker also discussed at some length the problems of safety, taxation and regulation.

### Securing Good Will of the Public

In his paper on urban transportation by public carriers, F. S. Welty, assistant general manager Omaha & Council Bluffs Street Railway, called attention to the need for developing good employee and public relations. Good will, said Mr. Welty, is not acquired merely for the asking. It requires courtesy, good service, good equipment, judicious advertising and a genuine desire to serve the public faithfully and well. Courtesy, he continued, goes into the matter of salesmanship and is the meat of selling better transportation better. It should be differentiated from politeness in that the latter quality is an acquired polish while courtesy comes from the heart. Good service cannot be given, added Mr. Welty, with unattractive, obsolete cars, operated over broken-down tracks by dissatisfied and discourteous employees. People today expect more and are in a position to demand it because there are other means of transportation available. Mr. Welty described in some detail the program of good-will development which has been followed in Omaha and cited the variety of employee contacts with the public which has been encouraged with the advent of the new management.

In the common carrier and utility field a regulated monopoly is better for the public than are numerous competitors serving the public, declared C. M.

## COMING MEETINGS OF *Electric Railway and Allied Associations*

***Nov. 21-22***—**Public Utilities Association of Virginia, Hotel Roanoke, Roanoke, Va.**

***Nov. 21-22***—**Central Electric Traffic Association meeting, Auditorium Hotel, Cleveland, Ohio.**

***Dec. 7*** — **Metropolitan Section, American Electric Railway Association, 33 W. 39th St., New York, N.Y.**

***Dec. 10***—**National Highway Traffic Association, annual meeting, Automobile Club of America, New York, N. Y.**

***Jan. 14-18, 1929***—**American Road Builders' Association, convention and road show, Cleveland, Ohio.**

***Jan. 22***—**New York Electric Railway Association, mid-winter meeting and dinner, Hotel Commodore, New York, N. Y.**

***Jan. 23-25, 1929***—**Electric Railway Association of Equipment Men, Southern Properties, and Southwestern Public Service Association, Mechanical Division, joint meeting, Houston, Tex.**

***Jan. 24-25***—**Central Electric Railway Association, Claypool Hotel, Indianapolis, Ind.**

***Jan. 25-26***—**Central Electric Railway Accountants' Association, Claypool Hotel, Indianapolis, Ind.**

***Jan. 28-Feb. 1***—**American Institute of Electrical Engineers, annual convention, 33 W. 39th St., New York, N. Y.**

***Feb. 14***—**Central Electric Railway Master Mechanics' Association, Youngstown, Ohio.**

Richardson, commissioner Iowa Railroad Commission, in discussing the Iowa motor carrier law and its administration. It is my belief, he continued, that the commission should at the disposition of motor carrier applications determine whether the existing transportation is adequate to the needs of the public, whether there is public demand for additional service, whether the applicant is able to engage in the undertaking which he proposes and whether the highways will permit of continued and reliable operation. The commission also should analyze the probable effect the establishment of other service would have from that which already exists. Mr. Richardson spoke at some length of the present Iowa motor carrier law and pointed out that it was enacted to bring about a comprehensive and coordinated scheme of transportation.

The meetings on two days of the convention were presided over by E. J. Anderson, general superintendent Tri-City Railway, Davenport. The delegates were welcomed to Cedar Rapids by Mayor J. F. Rall, who noted with pride that the delegates were assembling in the first Iowa city to voluntarily effect an upward adjustment of street car fares. Maurice Welsh, chairman of the executive committee, replied to the Mayor on behalf of the association. The annual banquet was the entertainment feature of Thursday evening, while on Friday afternoon the delegates were taken on a sightseeing tour of Cedar Rapids. Next year's convention will be held in Waterloo with Frank McDonald of the Waterloo, Cedar Falls & Northern Railway as chairman.

## Group Luncheon Meetings at Virginia Convention

FOR the first time the Public Utilities Association of Virginia will hold group luncheon meetings at its annual convention, which opens for a two-day session at the Hotel Roanoke, Roanoke, Va., on Nov. 21. These groups will meet at 1 p.m. on the first day, and will be divided as follows: Electric Light, Power and Telephone; Transportation; and Gas and Water. A leader will be in charge of each group to conduct the discussion of the subjects.

According to a statement made by A. B. Tunis, secretary of the association, about 350 delegates, men and women, are expected to attend the convention.

Several prominent public utility representatives from over the state and from Eastern cities have been secured to address the delegates. The addresses will include "The Relation Between Public Utilities and the Public," by William Meade Fletcher of the State Corporation Commission; "Some Problems of Urban Transportation," by Tom P. Walker, vice-president Virginia Electric & Power Company; "The State Conservation and Development Commission," by William E. Carson, chairman of the commission; "Investment Banking Views on the Public Utilities Business," by Harry R. Hayes, vice-president of Stone & Webster and Blodget, Inc., New York City, and "Fundamental Rate Base," by N. M. Argabrite, vice-president of the American Gas & Electric Company, New York City.

Recognizing the large activities of women folks in the industry, the association plans to organize a women's committee or auxiliary at the convention, according to an announcement made by the president, J. W. Hancock. With this in mind, Mr. Hancock said, a part of the program has been set aside for the formation of the auxiliary. Prominent women will address the group.

Anticipating the presence of about 100 women at the convention, several special features have been arranged by the committee in charge of the convention for their benefit and entertainment. Apart from sightseeing trips about Roanoke, the visiting women are scheduled to hold a luncheon at the Hotel Roanoke on Nov. 22, after which they will go to the Roanoke Country Club for a bridge tournament and a buffet supper dance.

# American Association News

## Special Reports Being Prepared

Following is a list of special reports that are being prepared by the bureau of information and service of the American Electric Railway Association and that will be available to member companies upon request:

*Bulletin No. 221*—Charts Illustrating Recent Trends in Electric Railway Operations and Electric Railway Bus Operations.—A reproduction of a series of charts prepared for exhibition at the 1928 convention, showing trends of traffic, revenues and expenses, fares and wages, automobile registrations and their effect on passenger traffic, growth of electric railway bus operations, methods of handling depreciation of buses, distribution of bus operating expenses and electric railway operating expenses, comparison of operating costs in 1927 and 1926, and other charts designed to show the outstanding trends in the transportation industry. The charts are accompanied by a running story explaining how they were compared and their significance.

*Bulletin No. 222*—Analysis of Bus Operations in California—This bulletin gives a comparison of the reports of independent bus companies of the California Railroad Commission for the years 1922 to 1926 inclusive. For each of the five years covered there is given for each company a complete income statement, balance sheet and statistics on the number of buses operated, car-miles run, passengers carried, etc. By means of this bulletin, therefore, one is able to trace over a period covering more than the ordinary life of a bus the record of investment and operating costs and their effects on bus operating profits.

*Bulletin No. 223*—Traffic Promotion on Electric Railways—This is a compendium of material collected from various sources, describing methods adopted and experiments tried out by electric railways in their efforts to build up increased traffic on their lines. In each case the experiment is described in some detail, together with the condition under which it was tried and a brief summary of results obtained. It is a revision of the material contained in Bulletin No. 37, issued Aug. 1, 1925, and includes all of the outstanding methods and innovations attempted since that time.

*Bulletin No. 224*—Electric Railways Operating Motor Bus Lines.—A new, revised list of electric railways now operating motor buses covering approximately 365 companies and showing for each company the date bus service started, the number of buses operated, miles of route, type of service, type and seating capacity of buses used, fares, and transfer privileges in effect.

*Bulletin No. 225*—Cost of Living Studies.

*Bulletin No. 226*—Effect of Fare Changes on Revenues and Riding Habit.—This is a revision of Bulletin No. 116, issued Dec. 1, 1926, bringing up to date the information contained in that bulletin and in addition including data on several more companies. The compilation contains a detailed record of the revenue passengers and passenger revenue month by month before and after the date of a fare change, and covers companies having had two or more fare changes. The average daily number of passengers carried and the average daily passenger revenue under each rate of fare is compared, and there is also shown a comparison of the percentage of revenue passengers using transfers and reduced rate tickets under each rate of fare.

*Bulletin No. 227*—Trend of Electric Railway Operations—A comparative record of the revenues, expenses, taxes, car-miles, revenue passengers, and operating ratio of a group of 127 companies for the first six months of 1925 compared with the first six months of 1924 and monthly thereafter, up through June, 1928. The group is also subdivided into separate similar statements for each of the geographical divisions of the country.

*Bulletin No. 228*—Depreciation Decisions.—This compilation brings down to date the information given in Bulletin No. 158, issued Sept. 1, 1927, containing extracts from decisions of public utility commissions fixing the rate of depreciation to be allowed on electric railway properties. It is preceded by a tabulation arranged by states of the rates allowed by commissions, showing the name of the commission and the depreciation rate fixed, the basis of the rate, whether on valuation or earnings, and the reference to the decision. It is followed by abstracts from the decisions, giving the commission's discussions and comments on the subject.

*Bulletin No. 229*—Cost of Living Studies.

In addition to the above bulletins the following supplements have been prepared, bringing the information they cover down to date:

Supplements Nos. 12 and 13 to Bulletins Nos. 163 and 164—Electric Railway Fares.

Supplements Nos. 1 and 2 to Bulletin No. 218—Wages of Trainmen.

Supplements Nos. 1 and 2 to Bulletin No. 219—Wages of Bus Men.

# News of the Industry

## Fare Increase in Minneapolis Formally Sought

Application was made by the Minneapolis Street Railway, Minneapolis, Minn., before the Minnesota Railroad & Warehouse Commission on Nov. 15 for an increase in the rate of fare, which is now 8 cents cash and six tokens for 40 cents. The company regards this the only recourse in the light of the decrease in patronage and the necessity of maintaining service at the present high standard. In other words, it is not possible to cut operating expenses in the ratio of the decrease in revenue and at the same time give good service.

The St. Paul City Railway, which has the same rate of fare as Minneapolis, applied on Sept. 8, 1927, for an increase, but this application was never acted upon. That application was made only after voters at St. Paul had twice at special elections refused to indorse an amendment to enable the City Council to give the railway relief in the case of some onerous taxes and charges which originated in horse-car days. The first defeat was in an election on Nov. 2. 1926, and the second Sept. 6, 1927, and the application for increase was made two days later.

Horace Lowry, president of the Twin City Rapid Transit Company, the holding corporation for the two cities' lines, accompanied the application with a statement which follows in part:

The local situation reflects the national condition. We are carrying 25,000,000 a year fewer passengers this year than we carried in 1925. The increase granted us on Jan. 1, 1926, did not anticipate this unprecedented falling off in passengers. Consequently, at no time since this date has the company earned a fair return on the value of the property.

Let it be understood that a fair return does not mean a return on the outstanding stocks and bonds of the company. A reasonable return on the fair value of the property never has been nor cannot be a guarantee of any earnings on stocks and bonds. It is a return on the established value of the property.

The existing rate of fare—8 cents cash or six tokens for 40 cents—is lower by 1 cent than the average fare being charged in the United States despite the fact that it is generally recognized that the Twin City railway service and equipment are as good or better than any other.

The average increase in the general price level of this country between 1913 and 1928 is approximately 60 per cent. In other words, it takes $1.60 today to buy goods costing but $1 in 1913. Applying this percentage of increase to street railway fares we find that an 8-cent fare would be the equivalent of a 5-cent fare before the war, but practically all of our patrons are paying only 6⅔ cents.

St. Paul and Minneapolis are growing, but this growth and the street car travel incident to it does not begin to offset the decrease in patronage. From 1920 to 1927 the population of the Twin Cities increased 10 per cent. During this same period revenue passengers decreased 25 per cent and passenger automobiles registered increased 102 per cent. And this 25 per cent passenger decrease occurred in the face of a determined and sustained advertising and promotional effort on the part of the company to increase street car riding.

If good street railway service is to be maintained it is not possible for the company to cut operating expenses in proportion to the decrease in revenues. Some service must be furnished which is not self-supporting. Therefore, the company's only recourse at this time is to ask for an increase in the street car fare.

## Post Graduate Courses in Louisville

The Louisville Railway, Louisville, Ky., recently held a second session of its post-graduate course for trainmen at which 85 attended. Examinations were taken by 82 men; 75 passed with a grade of better than 60 per cent, eighteen of whom made an average of more than 90 per cent. Of this number twenty were trainmen who had been in service three months and, of course, under the educational system it was compulsory for these men to attend. Sixty-five men attended the school of their own volition.

## Pressing Problems in Seattle

### Municipal railway debt not to be foisted on city. Avery plans retrenchment. Taxi franchise up again

SEATTLE'S remaining railway debt of approximately $11,000,000 will continue purely as a utility obligation against the railway system itself, according to a decision handed down Nov. 5 by the Circuit Court of Appeals in San Francisco. The decision was given in the suit of the Puget Sound Power & Light Company, in which the company sought to compel the city to resort to the general tax fund for maintenance of the railway. Under the ruling all efforts have failed to make the debt a general obligation upon the city because part of the street car revenues are used for the payment of salaries and current expenses.

Arthur Schramn, assistant corporation counsel, who assisted his chief T. J. L. Kennedy in arguing the case during a session of the Circuit Court in Seattle on Sept. 13, declared that the decision "contraverts the contention of the Puget Sound company that it holds a pledge in gross upon the Seattle railway revenues for the bonds which the city gave at the time the system was purchased." This contention was presented in a suit brought in January, 1927.

As a result of the recent joint conference between Mayor Frank Edwards, G. B. Avery, superintendent of city utilities, and members of the utility committee of the City Council called to discuss railway problems following the recent death of D. W. Henderson, former superintendent of railways, it was agreed to give Superintendent Avery free rein in his plan for reorganization of the railway department. Temporarily, at least, Superintendent Avery will be in charge.

Mr. Avery plans to create four divisions in the railway department, under which Roy E. Furse, present acting general superintendent, will become superintendent of the transportation division; A. E. Pierce, superintendent of the track maintenance division; A. H. Campbell, superintendent of the shops division, and Allen B. Hiatt, superintendent of the accounting division. Abolition of approximately 25 positions in the railway department is contemplated including a cut of one-half in the force of fourteen inspectors and a heavy reduction in the track maintenance division. Further reduction of operating costs aggregating $300,000 annually will result from a rerouting of car lines which he proposes.

Seattle voters will probably be asked to decide whether the city's deeply involved railway system should be leased to private operators, even if Mayor Frank Edwards and City Council members favor the leasing plan proposed by Karl H. Kaye. Mr. Kaye, member and representative of a group of investors, has offered to lease the railway system for 50 years, on a basis of 25 per cent of its net earnings, and to turn it back to the city debt free at the end of that time. He also seeks an exclusive franchise for the operation of taxicab and for-hire car service in Seattle for the same period, in order that the entire transportation system of the city may be harmonized. The Kaye proposal is to be considered at a general discussion of the railway problems by the Council and Mayor Edwards shortly. Pending a decision on the Kaye proposals, all other negotiations for an exclusive franchise on the taxicab service of the city, notably the application of Sam T. Taggart, which has been on file with the city for some time, will be suspended. Moritz Thomsen, widely known Seattle capitalist and business man, has announced that he is prepared

to give his financial as well as moral support to the proposed Taggart taxicab ordinance. Mr. Thomsen declares he is convinced that it provides a solution for some of the city's pressing transportation problems. The proposed ordinance would grant a 40-year franchise exclusively to Mr. Taggart, who operates the Red Top cab fleet, and return to the city 2 per cent of the gross receipts. It provides for the purchase by Taggart of all existing taxicab businesses.

Aid of the organized employees of the municipal railway system in bringing about a general financial and physical survey for the railway department to determine its status and needs before any drastic policy is carried out, is suggested by Councilman Otto Case. He has asked the Street Car Men's Union to join with him in asking for a general survey of the entire situation.

## Prizes Awarded in Illinois Station Beauty Contest

The Illinois Terminal Railroad System, electrified lines, has announced the winners of its station beautification contest conducted during the past summer season. In order to secure wide distribution of the prizes, the contest was divided into divisions, cash awards being made to the stations in each division making the best appearance by the planting, cultivation and care of flowers and grass, and also to the stations showing the best utilization of possibilities. There was also a grand prize for the station from all divisions which in the opinion of the judges made the best rating both in appearance and best utilization. This high award went to the station force at Gillespie, Ill., composed of Mr. and Mrs. E. Blauer, H. Johnson and R. D. Hays.

## Ohio Roads Seek Fare Increases

The Lake Shore Electric Railway and the Lorain Street Railroad have filed a request with the Ohio Public Utilities Commission for an increase of 5 cents in the fare between Lorain and Elyria. The present fare is 15 cents. Some time ago the commission granted the companies the right to raise the city fare in Lorain from 5 to 8 cents.

## Windsor Radial Line Does Well

Fares on the street railway system at Windsor, Ontario, cannot be reduced at the present time but if present revenues continue a reduction will be made at "some future time," W. R. Robertson, superintendent of Ontario hydro radial lines, told members of a joint transportation committee recently. A year or so, he said, may be sufficient to wipe out deficits. A motion made by Clyde Curry, Alderman, calling for the sale of nine tickets for 50 cents went over to another meeting to be held in two weeks, after members study a financial statement, copies of which are to be sent by Mr. Robertson to each Municipal Council.

## New Street Car Loading Plan in Vancouver

Use of automatic traffic signals has necessitated a change of policy in the handling of street car loading by the British Columbia Electric Railway Company, Vancouver, B. C. Loading berths for two cars have been established on all four sides of points where these traffic signals have been erected.

Some loading zones or platforms were used only as two-car loading berths during the rush hours, prior to the erection of traffic signals. At other hours during the day a car which had stopped in the second berth would stop again in the first berth to pick up any passengers standing there. Under the plan now in effect cars which stop in the second berth during all the hours of the day will not stop again at the first berth if the automatic signals will permit them to follow the first car around the bend or across intersections.

# Omaha Grant Accepted

**Railway ready for rerouting. Negotiations for sale of bridge between Omaha and Council Bluffs to cities to be resumed**

THE Omaha & Council Bluffs Street Railway, Omaha, Neb., has accepted the 30-year franchise granted by a three to one vote of the people of Omaha on Nov. 6. Within a short time committees representing civic organizations and the Council will take up with the management a rerouting of the lines in the belief that by this means revenues of the company can be materially increased, and the people served better. The present layout of the lines is not satisfactory to the company or to others, as many recent developments have tended to negative the value of routes established years ago.

Mayor Dahlman will also appoint a committee of officials and citizens to negotiate with the company for the sale to the two counties in which Omaha and Council Bluffs are located of the bridge across the Missouri River, over which street car and public traffic are carried. The voters in Council Bluffs approved a $400,000 bond issue to build that town's part of a new free bridge, but the proposal was beaten in Omaha, by 4,000 majority, where an $800,000 issue was submitted.

President Shannahan of the railway is credited by the local newspapers with having won the people over to confidence in the company and a desire to assist it out of financial difficulties. He says the company will enter into negotiations for the sale of the bridge, but points out that the proposal to charge the company for using the structure after the public becomes the owner is unfair. If it is really to be a free bridge the railway should operate over it without any tax as any rental would force the company to impose that rental on passengers in terms of fare and that this would result in the impossible situation of street railway passengers paying tolls while auto and bus passengers and others would ride free. The railway now pays the bridge company $60,000 a year rental.

Refinancing plans for the railway may be held in abeyance pending the settlement of this issue since the price and the other details of transfer of the bridge are likely to have a direct effect on net income. Under the agreement for their extension, bonds of the company still have two years to run before they mature.

## Case of Kansas City Company Before Council

At a meeting of the board of directors of the Kansas City Public Service Company, Kansas City, Mo., on Nov. 13, a report on the railway situation in Kansas City was approved to go before the City Council, probably on Nov. 19. The report is not in the nature of an application for a 10-cent fare or any other specified rate, but it states the facts in the situation as seen by the company and shows that since the city wants certain improvements made and the company would like to increase the wages of its employees, these things can perhaps be accomplished with an advance in fare, with 10 cents cash apparently the most logical rate.

To acquaint the public with the facts the board of directors authorized that the report be published in installments in the local press as advertisements.

## One-Man Cars on Four Lines in Oakland

Authority has been granted by the California Railroad Commission to the Key System Transit Company to operate one-man street cars on four lines, all in the city of Oakland, Alameda County.

## Safety Rewarded in Milwaukee

Bronze medals denoting completion of six consecutive months of safe railway operation were presented on Nov. 9, to 850 trainmen of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis. The presentations, made by division superintendents at the various car stations, marked the first milestone in a safety contest entered by the company's 1,700 motormen and conductors on April 1, 1928.

Silver medals will be awarded trainmen after twelve consecutive months of safe operation, and gold medals after two years. Trainmen who have chargeable accidents at any period of the contest must start anew to earn the gold award. Every accident, no matter how trivial, is recorded and only those in which trainmen are clearly not to blame are eliminated in determining the safety awards.

The medal is in the form of a small shield, to be worn on the lapel. A gold watch chain is attached.

## Sympathy from Seattle Car Men

More than 2,000 old friends and workers of David W. Henderson, superintendent of the Seattle Municipal Railway, Seattle, Wash., who died on Oct. 27 in that city, attended his funeral on Oct. 30. Hundreds of motormen and conductors were present in the uniform which Mr. Henderson wore for years when he was employed by the Puget Sound Railway & Power Company, and from whose ranks he worked up to the head of the city's railways. Among the hundreds of floral pieces was a gigantic emblem, a replica of car No. 312, which he drove over Queen Anne Hill for many years. This was made of yellow chrysanthemums, with the windows blocked in white and the borders in dark flowers. It was a tribute from the men with whom he worked.

## Mayor Wants Subway to Northeast Philadelphia

Mayor Mackey of Philadelphia declares that transit is the crux of the northeast situation and he wants to see transit lines pushed rapidly into the open spaces to the county line. He has in mind a $30,000,000 subway along Bensalem Avenue from Broad Street to the city limits.

# For the 80 per Cent Who Use Philadelphia Street Cars

PRESIDENT SENTER of the Philadelphia Rapid Transit Company, Philadelphia, Pa., has addressed a letter to all members of the P.R.T. family, requesting their closest co-operation in this effort to speed up the general movement of traffic. The entire organization will be keyed up for a united effort along this line. Operators of cabs and buses under Philadelphia Rapid Transit direction have been instructed to keep off the street car tracks unless it is absolutely necessary to drive there. The company says a similar appreciation by motorists and drivers of commercial vehicles of the need for keeping the car tracks open will aid tremendously. It is the hope of the company that the forthcoming advertising campaign in behalf of the 80 per cent will bring about an intelligent appreciation of mutual problems and will help to loosen the strangling grip of traffic congestion on the city streets.

Mr. Senter's letter follows in part:

P.R.T. has planned another campaign in the interest of the car-riders of Philadelphia, who constitute 80 per cent of the total users of our city streets.

Extreme traffic congestion in the central business district is already seriously hampering us in our task of transporting 2,500,000 riders daily, and when this congestions is increased by the Christmas shopping season efficient operation and close adherence to schedules will be still more difficult. There is no doubt that this year will bring the heaviest street traffic we have ever experienced.

Almost unlimited parking privileges, loading and unloading of trucks and numerous grade crossing interruptions are some of the things which daily cause so much delay to the car rider. Such snow storms as are experienced this year will, of course, greatly add to these difficulties.

Churches, civic bodies, business and improvement associations, and fleet truck owners throughout the city will be asked to co-operate with us in speeding up transit service. Coal dealers will be asked to help by not making deliveries during the morning and evening rush hour periods. Motorbus and taxicab operators will do their share by keeping clear of car tracks. Our supervisory forces will offer all the relief possible in cases of blockades and irregular car spacing. The aid of P.R.T. and M.B.S.C. stockholders will also be sought.

Advertising will appear in the daily newspapers, and folders and signs in cars, buses and cabs will be used to refresh the minds of the public on the causes of these delays, which are beyond our control.

Management is thus doing everything in its power to win the co-operation of the public. Every employee-owner, especially those manning our cars, buses and cabs, should do his part in rendering to the 80 per cent transportation as efficient as traffic conditions will permit.

Numerous opportunities will be afforded during these trying periods of operation to display courtesy, patience and salesmanship. P.R.T. employees, however, have never failed to rise to the occasion, and these are the things which I know you will give to the fullest extent. The willingness to do just that little bit more has made P.R.T.'s position in the transportation world such an enviable one. Be worthy of it this winter.




**An announcement in the New Orleans dailies about the discerning patrons who ride the street cars**

## W. A. Draper in Aviation

Walter A. Draper, president of the Cincinnati Street Railway, Cincinnati, Ohio, is one of the principal backers of the new Cincinnati Aviation Industry, incorporated on Nov. 12 at Columbus. It will manufacture airplanes, airplane motors and equipment in a factory to be built adjoining the Cincinnati Municipal airport. It has acquired the manufacturing rights, designs and patents of the Dietz Experimental Laboratories, Dayton, Ohio. It is anticipated that Mr. Draper will be named president.

## Interest in Community Fund in St. Louis

The Community Fund drive in St. Louis, Mo., will be in charge of a special committee so far as the activities of the St. Louis Public Service Company is concerned in this enterprise. Department heads will act as chairmen of subcommittees to be selected by them from the employees of their departments. Samuel Greenland, general manager, recently stressed the point that the collection was for a good cause, and as a matter of pride it was incumbent on the railway to make a creditable showing. The campaign dates have not yet been announced.

## Agreement Reached on Stupendous Newark Undertaking

After more than a year of negotiation the city of Newark reached agreements on Nov. 15 with the Pennsylvania Railroad and the Public Service Co-ordinated Transport on contracts providing for construction of a new railroad station, additional trackage, extension of the Hudson Tubes to Parkhurst Street in the south end of Newark, the building of a rapid transit trolley line in the bed of the abandoned Morris Canal, with a terminal beneath the new railroad station, and the opening of new streets and boulevards to hook up with the station plans. The whole project will cost nearly $25,000,000, with the railroad spending more than $10,000,000 and the city the balance.

Under the original plans worked out by railroad and trolley officials before Mayor Raymond died, Oct. 7, the city was to bear the cost of constructing the trolley terminal under the railroad station. At a conference on Nov. 15 at the Newark City Hall the railroad agreed to pay this part of the expense, providing the city gave up its effort to have the railroad pay for a new street on the east side of the new station.

President McCarter of Public Service is said to have agreed to pay the city a yearly rental of $125,000 for use of the canal bed trolley line in addition to the franchise tax of 5 per cent on gross receipts which it now pays. Originally the trolley company wanted to pay 4¼ per cent of the cost of construction with the franchise taxes deducted.

The city of Newark plans to construct a 100-ft. street west of the railroad for more than a mile and to build and rearrange other streets in the vicin-

ity of the station and the new tube extension station.

The project will take more than five years to complete. When it is finished Manhattan Transfer on the Kearny Meadows will be abandoned and transfers of passengers from electric to steam trains and vice versa will be made at Market Street, Newark, the site of the new station.

## P.R.T. Wants New Lease

The temporary lease of the Broad Street subway to the Philadelphia Rapid Transit Company, Philadelphia, Pa., expires on Nov. 30. Operation is resulting in a loss to the company of $10,000 a day. The P.R.T. feels it impossible to continue operation after Nov. 30 on the present terms. That is the substance of the formal notification sent by the company on Nov. 9 to Mayor Mackey.

One of the questions which President Senter of the company propounds is "How should this burden properly be borne?" He says in part:

The city has constructed a $100,000,000 subway which has added many millions of dollars a year to the cost of supplying transit to the people of Philadelphia without providing the revenue necessary to support it. That revenue can come only from the taxpayer by way of the city treasury, from the car rider by way of fares collected, or from both.

P.R.T. car riders now support the transit system in its entirety, aside from the Broad Street subway, out of fares collected. They can do more only if called upon to pay an increased fare. But why should the car rider be asked to pay the cost of a facility from which the greatest financial benefit goes to the real estate owners, the business interests and the city?

Mitten Management, faced with a similar situation in 1920, fought against a departure from the basic 5-cent fare, because we recognized the loss in riding which would follow a flat increase in fare. When the increase was forced upon us, P.R.T. lost 100,000,000 passengers the following year, almost three times as many as the $100,000,000 Broad Street subway will carry in 1929. For all these reasons Mitten Management will be found fighting on the side of the car rider.

As the Philadelphia *Ledger* sees it, this notice by the railway creates an acute situation. That paper says:

Somehow the city must solve a problem that includes the question of the city tax rate as well as the future usefulness of this $100,000,000 city investment. Philadelphia cannot afford and will not narrow the present wide gap between subway earnings and operating costs.

Taxpayers are now reaping the benefits of the city's high-speed transit facilities in the form of increased property values. The city is getting an increased tax revenue from the rise in these values. Car riders are now carrying as large a burden in carfares as they should.

In the face of this situation, the Mayor and Council should quit the "policy of drift" that has been followed and adopt a fair, business-like attitude looking to a just apportionment of the first costs of an improvement that will ultimately be of great value to the whole community. It stands now as a burden, for whose support no preparations have been made.

# Survey Under Way in Pittsburgh

### Allied Boards of Trade submit questionnaire to Pittsburgh Railways intended to be the basis for future study there. Query covers bus operation.

THE Allied Boards of Trade at Pittsburgh, Pa., has made public a list of questions put to A. W. Robertson, president of the Philadelphia Company and the Pittsburgh Railways, as part of the plan of a committee designated to make inquiries into the transportation situation in the city of Pittsburgh and its environs. An offer was made to arrange a joint meeting. The allied bodies, through a sub-committee of the transportation committee, queried the railway executive on many points of company financing, salaries and operating methods. The board said:

We are submitting the list of inquiries for the purpose of developing the situation. It is to be understood that the appointment of this committee and its resulting inquiry are prompted by a volume and number of complaints which have reached our body with reference to the quality and quantity of service furnished by the transportation company, together with disquieting rumors of operating losses. The list of queries follows:

1. *Ownership*—What is the stock and bond structure upon which interest or dividends are being now paid, or on which interest or dividends are accruing as a liability?

2. *Comparison* — Compare the present stock and bond structure with that existing as of Jan. 1, 1926.

3. *Byllesby Engineering & Management Corporation*—

A. What is the relation between the Pittsburgh Railways, the Philadelphia Company, and the Byllesby Engineering & Management Corporation?

B. What contracts, if any, exist between the Pittsburgh Railways, the Philadelphia Company, and the Byllesby Engineering & Management Corporation?

C. If no contracts, written or oral, exist, then what business relations are maintained between the Pittsburgh Railways, the Philadelphia Company, and the Byllesby Engineering & Management Corporation?

D. Does the Byllesby Engineering & Management Corporation manage the operation of the Pittsburgh Railways directly or indirectly?

E. If so, what remuneration or consideration is paid for this service?

F. Does the Byllesby Engineering & Management Corporation receive a percentage out of the income of the Pittsburgh Railways?

4. *Maintenance, new construction and improvements*—

A. What, if any, contracts exist between the Pittsburgh Railways, the Philadelphia Company, and the Byllesby Engineering & Management Corporation, covering maintenance, new construction and improvements? What emolument or consideration is received by the Byllesby Engineering & Management Corporation on sums expended for such work?

B. Is this consideration or emolument always for actual service rendered, and does the company receive full value for the sums so expended?

C. Is such payment a charge against the income resulting from the operations of the railways system?

D. Does the Byllesby Engineering & Management Corporation use its own capital, or are these improvements or additions made by the use of the capital or income of the Pittsburgh Railways?

5. *Finance*—

A. What, if any, contracts or arrangements exist between the Pittsburgh Railways, the Philadelphia Company and the Byllesby Engineering & Management Corporation in reference to financing the Pittsburgh Railways or any of its subordinate companies?

B. Does your company make financing cost a capital charge or is it paid out of the operating income?

C. Is this consideration or emolument always for actual service rendered and does the company receive full value for the sums so expended?

D. Is such payment a charge against the income resulting from operations of the railway system?

6. *Inter-company relations*—

A. What proportion of the income of the Pittsburgh Railways or its subsidiaries is absorbed by the other companies or corporations controlled by the Philadelphia Company or other companies controlled by or controlling the Philadelphia Company?

B. What contract, if any, now exists for the furnishing of power to the Pittsburgh Railways? How does this compare with the contract in force in 1926?

7. *Compare your total inventory as of today (nearest period) with your total inventory as of January 1, 1926.*

8. A. *What is the basis of the statements credited to your Mr. Fitzgerald asserting a loss of $60,000 a month in the operations of the railway?*

B. How does this compare with your operating results during the year 1926?

9. A. *Is your company willing to furnish the public a list of the salaries paid to its salaried officers? If so, does it?*

B. Compare these with salaries paid as of Jan. 1, 1926.

10. *Street car facilities*—

A. Does your company contend that the present railway facilities are adequate for public needs?

B. Does your company contend that they cannot afford to furnish better facilities to the public at the present 8½-cent rate of fare?

11. *One-man cars*—

A. Do your records show by increase of accidents that the hazard to the public is greater through operation of one-man cars?

B. Does the use of one-man cars result in slower traffic and delays to the public?

C. Do you not operate the one-man lines with substantially the same number of cars formerly manned by two men?

12. *Buses*—

A. Does your company contend that the 25-cent fare is necessary to operate buses at a profit?

B. Is not your fare very much in excess of that charged in other cities of like topography? If so, why?

C. What amount of percentage of the income from bus lines is consumed in salaries, other than wages paid to operatives?

D. Has the Pittsburgh Motor Coach Company been operating at a profit since Jan. 1, 1928?

## $30,000,000 Northern New Jersey Line

The North Jersey Transit Commission, on Nov. 15 decided to ask the New Jersey Legislature to authorize the immediate financing of a $30,000,000 rapid transit line between Newark and Paterson. This is the first step in the commission's program to link nine counties of northern New Jersey in a comprehensive system of rapid transit.

No suggestions as to the method of financing the plan will be made in the official request, but the commission has already opened negotiations with officials of the Erie Railroad for the use of the Erie tracks between Newark and Paterson and hopes to reach a satisfactory agreement before the Legislature convenes in January.

The proposed line, according to members of the commission, would save from twenty minutes to an hour in the traveling time between the two towns. By bus and trolley the time now required for the trip are 55 and 91 minutes respectively, as against the 36-minute schedule which the commission plans to operate.

The Newark-Paterson line is the first "leg" in the system planned by the commission to link the country seats and principal towns of Bergen, Hudson, Passaic, Essex, Union, Monmouth, Middlesex, Somerset and Morris Counties with rapid transit service, augmented by bus and trolley lines into the less thickly populated districts.

The commission, was created by the Legislature six years ago to study plans for the development of transit facilities in the northern end of the State. In February, 1927, it recommended the establishment of a transit loop, or belt line, linking New York and New Jersey. Some time later the problem of interstate transit was turned over to the Suburban Transit Engineering Board and the North Jersey Transit Commission was left free to formulate a transit plan for Northern New Jersey.

## Changes on *Electrical World* Staff

W. H. Onken, Jr., has been appointed senior editor of *Electrical World*, a McGraw-Hill paper. He has been connected with the organization since 1900. In 1906 he became managing editor of the publication and was made editor in 1916. His wide acquaintance throughout the electric light and power industry and his intimate familiarity with its problems have been important factors in bringing *Electrical World* into its present authoritative position in the electrical field. The position of senior editor will enable him to devote his editorial talents and knowledge of industry with greater freedom to special industry problems and to other editorial duties in the McGraw-Hill Publishing Company.

L. W. W. Morrow, managing editor, has been appointed editor with full authority and responsibility for the editorial conduct of the paper. Mr. Morrow joined the staff in 1922 as associate editor, coming directly from the electrical engineering department of Yale University. Prior to that experience, he was director of the school of electrical engineering in the University of Oklahoma. He was appointed managing editor of *Electrical World* in 1925.

Allen M. Perry, recently associate editor, becomes managing editor. In his fifteen years' service with the paper, Mr. Perry has been field man, junior and senior engineering editor, Western editor and associate editor at the home office.

## Brooklyn Company Sells Interborough Holdngs

As *Barron's* sees it the change in ownership by which the Brooklyn-Manhattan Transit Corporation divested itself of its holdings of Interborough stock is likely to have important bearing on New York traction mergers. Procedure by a strong group of stockholders would probably have been different from that which present officials of the company will probably take. In the one case profit on securities held would have been the main consideration; on the other hand, maintenance of present official positions is likely to dictate policy. In other words, if Interborough wins its 7-cent fare case the officials will probably not enter negotiations with the city with a view to merger of that property with the new city system and B.-M.T. properties. A 7-cent fare will probably prevent an I.R.T. receivership, and with that achieved the officials are not likely to risk loss of control in a merger.

To *Barron's* it seems likely that, Chairman Dahl, Chairman Wiggin of finance committee and their associates, said to have working control of Interborough Rapid Transit at such time as the Interborough Rapid Transit stock was released from voting trust agreement (last year), parted with their holdings also. It was brought out in hearings before Transit Commission last year that Gerhard M. Dahl held 6,600 voting trust certificates of Interborough Rapid Transit and that Waubesa Corporation, in which Mr. Dahl was interested, also held 6,600 certificates. A. H. Wiggin held 3,000 certificates and Thomas L. Chadbourne, associate of Mr. Dahl, had 9,800. Says the source quoted:

The B.-M. T. is an able management and there is no reason why it might not get the contract for operating the new subway system if B.-M. T. rapid transit lines are merged with the new system being built by the city. Again, as part consideration for favorable action by B.-M. T. in reaching agreement as to merging its subway and elevated lines with the city, the latter might be induced to look with favor on a merger of the company's surface lines with Brooklyn City Railroad, or at least award it the franchise for bus routes in Brooklyn. If Brooklyn City and B.-M. T. surface lines were merged and proper 5-cent fare zone laid out, surface lines in Brooklyn could be put on a paying basis.

## Bigger and Better Records in Chicago

THE increase in the number of riders on Chicago's street railways, which amounted to 26,322,000 rides for the first nine months this year compared with a similar period in 1927, has attracted attention as offering further concrete and tangible evidence indicative of the importance of the street car in the populous centers.

Each month this year has set a new record in total rides for that month, although there were slight decreases in revenue passengers in April and June compared with corresponding months in 1927, according to figures furnished by the Chicago Surface Lines.

The increase for the nine months, according to these statistics, is more than twice as many rides as the total annual increase of 1927 over 1926. This demand has been met by schedule revisions and additions to the rolling stock of 27 city lines.

## German Visitor Says Railway Is Backbone of Transportation

Motion pictures of traffic congestion in leading American cities are to be used by officials of German electric railways as a warning of what may occur in Germany if the growing traffic problem there is not met at once.

Dr. Phillip Kremer, assistant to the general manager of the Berlin street railways, sailed on the *Columbus* recently for Germany with a set of films which he had made in several cities within six weeks.

Traffic congestion is increasing and the number of automobiles is expected to double within the next year in Germany, Dr. Kremer said on sailing. He added that he would recommend that street cars be continued as the backbone of Berlin's transportation system. The system now uses 3,500 cars and 600 buses, and he said he believed this proportion was about correct. He said:

We are going to use the street car as the major means of transportation for the dual reasons that we can carry passengers cheaper by car than by bus and that the car causes less street congestion. I came to the United States with an open mind on this question, and I am returning firmly convinced that the American method of using the bus as a supplement service only is the proper one.

## A Tramway Jubilee

The Nottingham Tramways, Nottingham, England, completed a half century of existence on Sept. 17. It was in 1878 that the first horse cars were put into service in the town. They were single-deckers, and each seated 24 passengers. The Town Council took over the undertaking in 1898 and now there are 200 electric cars, 76 buses and twelve trackless trolleys.

# Foreign News

## Berlin Consolidates All Transportation Lines

The City Council of Berlin has voted to consolidate under one management the rapid transit surface car and bus lines in the city.

For some years, the city has owned the surface lines outright, as well as a large controlling interest in both the rapid transit system and the Berlin General Omnibus Company, which controls all bus operation in Berlin. Separate corporate management was retained for these three undertakings, but their general policies were determined by a central commission. Now there will be actual consolidation, which it is expected will bring about a number of economies. In 1926 the division of traffic between the different agencies was approximately 813,000,000 passengers carried by the surface lines, 113,000,000 by the bus lines and 163,000,000 by the rapid transit lines. It is expected the consolidation will go into effect on Jan. 1, 1929.

## Poland Extends Railways

Extensions of electric tramways and light railways in Poland are being made. The Société des Tramways Electriques du Bassin de Dombrowa, a Belgian firm, has recently completed and opened to traffic a number of lines in the Dombrowa district. The Société des Chemins de Fer Electriques Suburbains, another Belgian firm, has completed a line 20 miles in length in the Warsaw district.

## Ninth Report from Melbourne

For the year ended June 30, 1928, the total revenue of the Melbourne & Metropolitan Tramways Board, Melbourne, Australia, was £2,494,100 compared with £2,505,855 for the previous year. Receipts from passenger fares totaled £2,476,644 compared with £2,487,573 for the preceding year. This decrease and failure to obtain the "normal" increase in revenue which usually follows the yearly increase in the population of the metropolis is attributable, according to the report of the Tramways Board, to the prevailing industrial depression and increasing use of the private motor car, particularly during the week-ends. Passengers carried totaled 220,353,333 compared with 224,211,867 for the previous year.

The traffic receipts per bus-mile of the Williamstown bus service were 14.79 pence, resulting in a loss of approximately £3,000 on the year's operation after making provision for standing charges, interest, and reserves. The Balwyn bus route showed a loss for the year of approximately £6,000.

Total working expenses amounted to £1,722,967 compared with £1,777,107 for the previous year. The net surplus from operation was £771,133 and when carried to the appropriation account was reduced to £445,178. After consideration of appropriations there was a deficit of £27,061 met by transfer from general reserve fund and balance brought forward from the previous year.

A reference is made to the conversion to electric traction of the Richmond Cable Tramway, opened on Dec. 4, 1927.

## Improvements in Rio de Janeiro

Program for track improvements including paving, repairs, and extension of lines is being carried out consistently by the Rio de Janeiro Tramway, Light & Power Company, Ltd., and the affiliated Jardim Botanico company. These two companies laid nearly 16 kilometers of new lines and relaid 49 kilometers during the year ended June 30, 1928. During the year 49 per cent of the cars of these two companies were repaired and repainted. The distance between stopping places for trams has been modified, the average being 200 meters, which greatly assists in accelerating the movement of traffic.

# Swiss Railways Show Great Progress in Electrification

### Roads make best showing recorded in any year since 1913. Passenger receipts make new high record

WITH the conversion of an additional 109 miles of line to electric traction in 1927, the total length of electrified mileage of the Swiss Federal Railways is now 1,035 miles, or approximately 58 per cent of the total length of the system, namely, 1,791 miles. In 1922 only 12 per cent of the total length was electrified, so that progress has been remarkably rapid. Naturally this development has been stimulated by the excellent water power facilities in Switzerland.

Electric train mileage rose last year by about 25 per cent, compared with 1926, but the cost of electric power rose only 15 per cent, a result which is considered to be due chiefly to the more efficient utilization of current. All the main arteries of railway traffic in Switzerland are now electrified, and about 94 per cent of the total power required is produced by the Federal Railways Administration at its own power stations. These are in two groups—one in the Gothard district and the other in Valais. A notable feature is the great fall in the cost per unit which occurred as the scale of electrification was extended so swiftly. Conditions have been fairly normal in this matter since 1924, and a comparison starting from that year shows a sharp fall in the cost of energy from 9¼ centimes per kilowatt-hour in 1924 to 5⅜ centimes in 1927. It is calculated that the saving in fuel costs consequent upon electrification has been very large.

The Swiss railways have been shielded from severe road competition by the nature of the territory served and the introduction of improved travel facilities. Such competition as has been encountered appears to have affected freight traffic rather than passenger business, for the proportion of gross railway revenue derived from the latter class of business has actually risen slightly of recent years—from 33 per cent in 1924 to more than 36 per cent in 1927. On the other hand, the ratio of freight revenue to the total has fallen over the same period from 60 to 55 per cent. The total receipts of the system in 1927 were 395,000,000 francs, and it is estimated by the administration that were it not for road competition they would have been 36,000,000 larger.

Partial reduction of freight tariffs have, however, had a beneficial effect on the financial position of the system, for they have led to a big rise in the tonnage transported, which was 17,813,000 in 1927, a steady rise from 13,245,000 tons in 1922. At 12¾ francs per ton, the average receipts from freights in 1927 were lower than for several years, owing to reduced charges, but, as a result of the big growth of traffic, the total receipts are among the best recorded in the history of the system. Passenger receipts, moreover, set up a fresh high record, and undoubtedly the enterprising advertising policy which the administration adopts in order to attract foreign tourists is a powerful factor in this satisfactory showing.

After allowing for working expenses, which are being kept well within bounds, and for debt interest, which has been increasing rather rapidly of late, the surplus from 1927 operations was 21,000,000 francs—the second best result since before 1914, and almost as good a surplus as that realized in 1913, when debt charges were very much smaller.

## London Paper Changes Name

*The Electric Railway, Bus & Tram Journal* is the new name of the well-known *Electric Railway & Tramway Journal* of London. The new name appears with the issue of Oct. 12, 1928. An editorial explanation says that tramways are still the only possible vehicles for the cheap transportation of great masses of people who have to travel by necessity at the peak hours, but there are many tramway systems which also need a more mobile vehicle. On some such systems motor bus service will replace the cars.

# Recent Bus Developments

## Situation Due to Withdrawal of Detroit Jitneys Well in Hand

Del A. Smith, general manager of the Department of Street Railways at Detroit, Mich., is of the opinion that the situation created by the withdrawal of the jitneys is well in hand. He was confident additional equipment obtained by the railway department would meet any demand placed upon it. He said that so far as transporting passengers was concerned a normal condition had been established.

Mr. Smith is seeking to improve service on all lines, but particularly on Woodward, Jefferson, Grand River Avenues and Fort Street. On these arteries many persons formerly were served by the jitneys.

Mayor John C. Lodge has approved the rental of the additional equipment from Cleveland, although the figure at which these cars are to be rented has not been determined. The cars were shipped from Cleveland over the interurban lines and are now in regular service in Detroit.

## Between Hackensack and Rutherford by Bus

Abandonment of the Public Service Co-ordinated Transport Company's trolley line between Hackensack and Rutherford, as contemplated by five of the affected municipalities and the company, has been approved by the Bergen County Board of Freeholders at Hackensack. The trolley line to be taken up is part of the route between Newark and Hackensack. Three of the communities have already completed arrangements with Public Service. They are Hackensack, East Rutherford and Carlstadt. Woodridge and Hasbrouck Heights are now negotiating.

It is planned to substitute an adequate bus service on the route. Public Service, it was said, was losing money on the line.

## Normal to Have New Service

The State Railway Commission has granted the Lincoln Traction Company, Lincoln, Neb., permission to substitute bus service for car service to Normal, an eastern suburb. The proposal was opposed by the city and also by some of the people in the section served by the railway, which, when first built, cut diagonally across open country. This section is fairly well settled, but has little or no paving. In opening a street necessary to connect present paving with that contemplated the city would have inflicted an expenditure upon the railway which has no reserve for that purpose.

The railway commission took the ground that it was more interested in seeing railway service maintained than in paving, and that as the company could not be compelled to invest more capital in the enterprise, the case would be continued so as to permit an agreement to be made. This, however, was found impossible, and when the second hearing date arrived, the commission authorized the railway to take up the rails and to supply service by bus over paved streets to sections now without organized transportation routes.

## Another Move in Knoxville Bus Case

The Knoxville Power & Light Company, Knoxville, Tenn., has placed a new bus proposal before the City Council's bus committee. The company is willing to establish four bus routes within the city. At the same time it has asked permission to abandon its Kingston Pike trackage from Third Creek west to the city limits. Bus service will be substituted on this route, under the plan.

> The City Council of Knoxville, Tenn., voted on Nov. 9 in executive session to consider the bus proposal of the Knoxville Power & Light Company carrying 7-cent car and bus fares.

The proposal comes as a result of an invitation from City Manager Otto Roehl for the company to clarify its position on this matter in order that disposition may be made of it in the Council.

A 7-cent fare would apply to any combination street car and bus line. Free transfers would be given.

The four bus lines proposed would penetrate the areas originally laid out for extension of transportation facilities. These are: One out Sevierville Pike; one northward to Whittle Springs territory connecting with the Sixth Avenue car line; one through Beaumont; another through West Lonsdale.

It is understood that the 7-cent fare comes nearer meeting the ideas of City Manager Roehl than the original 6-and-4 cent plan, the passenger to pay 6 cents on boarding the street car and 4 cents additional for his transfer.

## Expansion by Pacific Electric

The Pacific Electric Railway has applied to the California Railroad Commission for a certificate of public convenience and necessity to operate auto stage service between Huntington Drive and Eastern Avenue in Los Angeles, and Commonwealth Avenue and Fremont Street in Alhambra.

## Discontinuance Petition Dismissed in Indiana

A petition filed by the Evansville & Ohio Valley Railway to discontinue freight car service between Evansville and Mount Vernon, Ind., has been dismissed by the Public Service Commission on request of the petitioner. The line has been abandoned and motor truck service substituted.

## Controversy Over Abandoned Ohio Territory

Another Eastern Ohio traffic controversy has been carried to the Ohio Public Utilities Commission for settlement. Objections were raised when the Youngstown & Suburban Transportation Company, subsidiary of the Youngstown & Suburban Railway, abandoned its bus lines between Canton and Salem, a run of 33 miles. It was under approval of the Ohio commission that this route was abandoned, and a new service begun in conjunction with the Stark Electric Railroad. Instead of buses every two hours out of Canton for Youngstown, Stark Electric cars now leave every hour, making connections at Salem with the Youngstown & Suburban buses for Youngstown. Through co-operation on the part of the two companies the service was doubled.

Hardly had the new service been started before two transportation companies filed petitions with the Ohio Public Utilities Commission, asking permission to operate over part of the route abandoned by the Youngstown & Suburban. The latter has protested to the Ohio commission, asking that petitions filed by the Warren-Salem Coach Line and the Salem-Akron Transit Company for passenger service certificates be denied.

Hearings on the original petitions for certificates are scheduled for early next month.

## Survey Will Determine Possibilities of Bus in Memphis

Permission to establish a bus line in Memphis, Tenn., will not be acted upon by the city until a careful survey and study is made of other cities where trolley cars and buses operate. This statement was made by Mayor Watkins Overton on Nov. 13.

Application of an unnamed bus company for a franchise to operate in Memphis with a capital of more than $1,000,000, was to be heard by the City Commission, the Mayor said, but the matter will be taken under advisement until after the city's investigation is completed.

Statements of T. H. Tutwiler, president of the Memphis Street Railway, that his company would operate buses if a real need for them existed also will be considered by the City Commission before a franchise is awarded or denied, according to the Mayor.

# Financial and Corporate

## Seeking to Lift Receivership

**Another move to straighten out affairs of Second Avenue Railroad, New York, in court's hands since 1921**

THE committee representing the holders of certificates issued by the receiver of the Second Avenue Railroad, New York, has made public a plan for terminating the receivership and reorganizing the company.

The committee bid in the property at the sale on Sept. 22, 1927. On confirmation of the sale it proposes to organize a corporation with a capital of 34,000 shares of no-par common stock, to which it is proposed to assign the bid so that a conveyance may be made directly to the corporation.

It is expected that the new company will be called the Second Avenue Railroad Corporation. Under the plan, for each $1,000 of receiver's certificates the holders will be allotted ten shares of the new company's stock. This allotment will require 31,400 shares, and the remaining 2,600 shares, or so much thereof as is necessary, may be used in the discretion of the committee, on the same basis, to satisfy the contract creditors whose claims are on a parity with the preferred certificates.

When the plan is consummated the property will have been fully cleared of the long receivership and the ownership and management will be vested in the certificate holders. Unless the holders of more than one-third in amount of the outstanding certificates of deposit within 30 days from the filing of the plan with the depositories file with the latter written notice of their dissent specifying the number of certificates held by them, the plan will become effective and will be binding upon all depositors.

A. W. Hutchins, acting for the committee, bid in the properties at the sale in September last year for $500,000, payable in receiver's certificates as autorized by the judgment of the Supreme Court of New York County on June 29, 1921, conditioned on the approval of the plan of Aug. 18, 1927, by the Transit Commission. This approval was denied by the commission by order dated Feb. 2, 1928.

Land and buildings owned by the railroad and covering the block bounded by 96th and 97th Streets and First and Second Avenues, were appraised by the Transit Commission in 1921 at cost less depreciation at $2,428,148, and are assessed for taxation on the 1928 list at $1,425,000.

The committee is informed that the receiver's accounts will show upward of $300,000 available for distribution to meet personal and property damage claims which have accumulated, to which will be added about $35,000, the proceeds of sale of certain real estate, and it is anticipated that the committee will receive sufficient moneys from this source to pay all its obligations, counsel fees and compensation, and effect the reorganization. In the event the amount received is not sufficient for the purposes, the committee will borrow any additional sum on mortgage of the property or a part thereof.

Receiver's certificates were outstanding to $3,030,000 principal amount at the judgment of June 29, 1921. This sum with $1,727,100 interest due and unpaid to Oct. 1, 1928, will run the aggregate to $4,757,100.

## Lease of 10-Mile Electric Branch Authorized

The Interstate Commerce Commission has just announced that division 4 had approved a report and order authorizing acquisition by lease of the Chowchilla branch of the Visalia Electric Railroad, extending from a connection with the Central Pacific Railway at Chowchilla, Cal., to a point in block 42 of Dairyland Farms subdivision No. 2, a distance of 10 miles.

## Separating Transportation and Power on Ohio Property

Application to buy the power and light properties of the Cleveland Southwestern Railway & Light Company, Cleveland, Ohio, was filed by the Reserve Power & Light Company with the Ohio Public Utilities Commission, on Nov. 9. The purchase price was given at $2,087,165. The properties are located in the counties of Cuyahoga, Medina, Lorain, Wayne, Richland, Crawford, Ashland and Morrow, and are located along the right-of-way of the Southwestern.

Interurban and motor coach transportation business of the Southwestern will not be affected by the purchase. According to attorneys of the company, F. H. Wilson, president and general manager of the Southwestern, is an official of the Reserve Power & Light Company. The application to sell the light and power properties is said to be the start of a movement to divide the power and transportation business into separate managerial organizations.

## James Ketner a Kansas City Director

James Ketner has been elected a director of the Kansas City Public Service Company, Kansas City, Mo., operating the co-ordinated railway and bus service in that city, to succeed Herbert M. Woolf, who had asked to be relieved to conserve his time for his many other interests, among them an expanding group of stores and a growing chain of theaters.

## $5,000,000 Bond Issue in New Orleans

The Commission Council of New Orleans has approved the $5,000,000 bond issue of the New Orleans Public Service, Inc. The proceeds of the sale, which is expected to realize approximately $4,600,000, will be devoted to the retirement of a bond issue in connection with the purchase of the Edison Electric Company and improvements. The bond issue to be retired amounts to $2,000,000 and about $2,500,000 will be used for improvements.

In connection with the bond issue Commissioner of Public Utilities Hall submitted a report from R. V. Whittaker & Company, auditors for the department, showing the financial condition of the company and approving the issue. Only that part of the proceeds of the bond sale actually used for improving the company's facilities will be added to the capital rate base.

The auditing firm also submitted a report on its investigation of the opposition of the company to the Fernandez bills before the last session of the General Assembly. The auditors said the money spent was a legitimate expense. It amounted to slightly more than $6,000. Of that sum $4,500 went to W. A. Porteous, Jr., an attorney regularly employed during sessions of the Legislature, and $2,485 to Forrest Pendleton, another representative. The bills in question were designed to give the city of New Orleans the right to acquire all property of the Public Service.

The New Orleans Public Service, Inc., supplies electric power and light, natural gas and street railway service in the city of New Orleans. In 1922 a settlement was effected with the city under the terms of which the sum of $44,700,000 was agreed upon as the value of the properties in the system as of Dec. 31, 1920, for the purposes of the settlement, to be increased by future investments in the property. The settlement ordinance provided for the allowance of such rates for the company's various public services as would produce a 7½ per cent return on the rate base as determined from time to time, after operating expenses, taxes and reserve for renewals and replacements.

The rate base as at Sept. 30, 1928, was in excess of $79,800,000, upon which the present allowed return, before deducting appropriations for renewal and replacement reserve at the current rate of $1,866,000 per annum, is about $7,851,000. This compares with actual net revenues of $7,082,600 for the twelve months ended Sept. 30, 1928. In addition to the allowed return on the rate base, the settlement provides, among other things, for indeterminate permits, for the approval by the Commission Council of the city of the issue of securities and for an option to the city to purchase any or all of the three departments of the company at the current rate base valuation. These departments embrace gas, electric light, power, and railway services.

## Mr. Cabot Answers Mr. Scharff

Phillip Cabot has contributed to the *Atlantic Monthly* for November an article entitled, "Ethics and Politics—the Public and their Utilities." In some respects it is in the nature of a reply to the article by Maurice R. Scharff, which appeared in the September *Atlantic* and was digested in the ELECTRIC RAILWAY JOURNAL for Sept. 1, page 362, under the title "A Dictator Suggested."

Mr. Cabot finds that the American people are overwhelmingly opposed to government interference in business. He finds that the public is protected by regulation through state commissions from excessive prices paid to operating companies and that holding companies cannot possibly oppress customers of local companies because holding companies have no contact with them.

Mr. Cabot's chief point seems to be that commissions have erred in seeking to regulate profits of operating companies, rather than prices. He declares that "profit is the spur to private initiative; without it ambition and progress are destroyed, and, therefore, profit regulation as a method of price regulation is vicious."

The author says that the "present tendency of commissions to determine net income, or profit, and to regulate that is wholly opposed to the best interest of the consumers." He believes that by this system the investor is pampered while the consumer is neglected. Mr. Cabot says:

> It is entirely possible to regulate gross income—that is, prices—directly, and if this is skillfully done profit will be effectively and justly regulated. Today this is not done. Profits are not regulated—they are confiscated.

## Baltimore Depreciation Hearing Advanced

The Maryland Public Service Commission has set Nov. 19 as the date to open the depreciation hearing in the fare case of the United Railways & Electric Company, Baltimore. Details of the survey of the company's property could not be fully completed by Nov. 15, the time originally set.

## Equipment of Penn Yan Road to Be Removed

Under a Federal court permit issued by Judge Simon L. Adler of Rochester, William J. Tylee, Penn Yan, as receiver for the Penn Yan & Lake Shore Railway is now allowed to sell the assets to benefit the creditors and bondholders. This 9-mile railway ceased operation some time ago.

The rails, power line and rolling stock and the equipment in the yards have already been sold to the S. Snyder Corporation of Rochester. Work is expected to begin at once in removing the tracks from the streets of Penn Yan and along the west lake road. The line leaves the state road at Keuka Park and runs in past Keuka College.

Buses have taken the place of the old line now, with daily service furnished along the lake from Penn Yan to Hammondsport and Bath. The trolley cars are now "parked" in the power house at Keuka Park. Years ago Electric Park, near the power house, with a dance hall and other attractions, was a rendezvous for pleasure seekers. The real estate owned by the Penn Yan & Lake Shore Railway will be sold later.

## New Member on Springfield Board

Bentley W. Warren, for some years counsel for the Springfield Street Railway, Springfield, Mass., was added to the board of directors of the company at the annual meeting on Nov. 8. He will continue to serve in the capacity of counsel. Mr. Warren is unusually well informed on railway economic problems.

# Finis Written to Detroit United

### Exchange of securities under way in new company successor under foreclosure to Michigan road

A. L. DRUM, president of the Eastern Michigan Railways, the successor to Detroit United Railways, states that the new company is now in possession of the properties and that he confidently expected that the full interest on the new adjustment mortgage bonds would be earned and paid when due on April 1 next. Eastern Michigan-Toledo Railway is a wholly owned subsidiary formed to take over the Detroit, Monroe & Toledo Short Line Railway. Properties were acquired on behalf of bondholders at recent foreclosure sale.

The reorganization committee of Detroit United Railway recently issued the following notice:

On and after Oct. 18 cash and bonds and voting trust certificates for common stock of Eastern Michigan Railways, bonds of Eastern Michigan Toledo Railroad, and fractional scrip certificates will be ready for delivery to holders of certificates of deposit entitled thereto under the provisions of the reorganization plan. Bonds and fractional scrip certificates will be delivered in bearer form.

To obtain deliveries of new securities the holders of certificates of deposit must surrender the same in negotiable form to the depositary which issued them. In all cases where voting trust certificates are desired in names other than those in which certificates of deposit were issued or are registered the cost of the required federal and state transfer tax stamps must be paid to the appropriate depositary by those surrendering such certificates of deposit.

Those desiring new securities forwarded to them must state the forwarding agency desired and remit the cost of transmission to the appropriate depositary. They must likewise state whether and at what valuation they desire such new securities to be insured and must similarly provide the cost of such insurance.

Until Nov. 17, 1928, first mortgage and collateral trust sinking fund five-year 6 per cent bonds of Detroit United Railway and first mortgage 5 per cent 30-year gold bonds of Detroit, Monroe & Toledo Short Line Railway may be deposited under the reorganization plan without penalty.

Securities of Eastern Michigan Railways will consist of first mortgage and collateral trust bonds limited to $5,000,000, of which $3,350,000 are to be issued immediately and the balance reserved for issue under various restrictions as set forth in the reorganization plan promulgated last April, and $4,915,000 of convertible adjustment mortgage bonds. Both issues bear 7 per cent interest.

First mortgage bonds of the Toledo company will total $2,000,000 and bear 7 per cent interest.

Common stock of the parent company will be issued in the amount of 200,000 shares. An additional authorized 200,000 shares will be reserved for conversion of adjustment mortgage bonds. The subsidiary company's stock will consist of 50,000 shares. The parent company will not assume liability for the payment of interest or principal of the subsidiary company's bonds.

## Ohio Interurban Set for Suspension

Abandonment of the Southern Ohio Public Service Company's interurban line between Columbus and Zanesville was authorized on Nov. 13 by the Ohio Public Utilities Commission. Service between Columbus and Newark will be discontinued after Jan. 15, and from Newark to Zanesville later.

The company contended that it lost $80,644 in the year ended Sept. 30, and that it was not financially able to meet the cost of street improvements in the cities it serves. Such contemplated improvements would cost the company an aggregate of $600,000, the company contended.

The late date for the abandonment of the Zanesville-Newark section was set so that application for bus service in the region may be acted upon before interurban service stops.

## Fort Wayne Stock Offered

Authority to issue and sell 85,000 shares of its common stock without par value to yield $850,000 was asked in a petition filed with the Public Service Commission on Nov. 10 by the Indiana Service Corporation, Fort Wayne, Ind. The petition recites that the proceeds will be used for capital expenditure already made or planned to the company's interurban and local electric railways and electric light and power facilities.

The company during the year has made extensive improvements in its railway properties, including several miles of track extensions in the city of Fort Wayne, and has built additional mileage in electric transmission lines. The Indiana Service Corporation is a subsidiary of the Midland Utilities Company, Chicago.

## Dividend Payment by Brooklyn City Railroad

The Brooklyn City Railroad, Brooklyn, N. Y., has declared a dividend of 10 cents a share on the capital stock of $10 par value. This is the first payment on the issue since March 1, 1927, when a distribution of the same amount was made. The dividend is made payable on Dec. 15 to holders of record of Dec. 1.

## Twin City Net Lower—President Sees Earnings at Ebb

The Twin City Rapid Transit Company and subsidiaries, Minneapolis, Minn., report for the quarter ended on Sept. 30, a net loss of $17,867 after taxes and fixed charges. This contrasts with net income of $149,111 in the preceding quarter, equivalent after allowing for preferred dividend requirements to 44 cents a share on 222,000 shares of common stock, and with a net income of $93,663 or 18 cents a common share in the third quarter of 1927. Net income for the first nine months of 1928 was $555,804, equal after preferred dividends to $1.81 a common share, against $838,058 or $3.09 a share in the first nine months of the preceding year.

Horace Lowry, president of the Twin City Transit, in a recent letter to a Canadian shareholder, says that he personally is optimistic as to the future and expresses the hope that Canadian shareholders of the company will not be tempted to sell their stock at the present low price.

The Canadian *Financial Post* says that President Lowry apparently bases his hopes for improvement on the fact that, while the number of street-car riders has been decreasing from year to year, the year 1928 so far has shown smaller decrease than has been the case in any year since 1920.

Explanation for the interest of the Canadian financial paper in the Twin Cities case is to be found in the fact that the company has a large financial following in the markets of Toronto and Montreal.

Elsewhere in this issue is an item referring to the fare situation in the Twin Cities that includes a statement in which President Lowry reviews the past in them and the probable prospects for the future.

## Income from Dividends in Washington Taxable

The dividends received by the Washington Railway & Electric Company, Washington, D. C., from the stock of the Potomac Electric Power Company, which it owns, form a part of its "gross receipts" and are taxable under the law at 4 per cent, according to an opinion of the District Court of Appeals rendered by Justice Charles H. Robb. Interest and dividends from investments and rent from lands, buildings and equipment received by the Potomac Electric Power Company are also held to be taxable as part of "gross earnings" after allowance for cost of raw materials and the like.

The decision means that the railway company will be called upon to pay $151,200 to the District tax collector, representing 4 per cent on the dividends paid by the power company since the case was taken to court in 1925.

The total of dividends paid since the case went to court to date is $3,780,000. Of this $840,000 was paid in 1925, $960,000 in 1926, $1,080,000 in 1927 and $900,000 thus far in 1928. The dividend rates in the various years were as follows: 1925, 14 per cent; 1926, 16 per cent; 1927, 18 per cent, and 1928, 20 per cent.

The railway owns $6,000,000, or the entire issue of common stock in the power company. In addition to this stock issue there is outstanding $5,000,000 of 5½ per cent preferred stock and $2,000,000 of 6 per cent preferred stock not owned by the railway and therefore not affected by this decision.

The commissioners included the power company items in the assessment, but the companies disputed the matter and brought suit in the District Supreme Court for an injunction to prevent the collection of the taxes. The lower court upheld the action of the commissioners and the companies appealed.

## Earnings Increase in Indianapolis

Net earnings of the Indianapolis Street Railway, Indianapolis, Ind., showed an increase in October of $9,572, according to a report filed with the Indiana Public Service Commission. Earnings were $114,209, against $104,637 for the similar month of 1927. Net earnings for the first nine months of the present year are $107,016 more than for the corresponding period of 1927.

# Personal Items

## Messrs. Blair and Egolf in the News

Col. Edward J. Blair, general manager of the Chicago, Aurora & Elgin Railroad, Aurora, Ill., has been summoned to Chicago by the surface and the elevated lines to assist in working out a solution of the railway problem in that city. John F. Egolf, vice-president of the Western United Gas & Electric Company and former general manager of the Chicago North Shore & Milwaukee Railroad, succeeds Colonel Blair as general manager of the "Aurora and Elgin." The order transferring Colonel Blair and appointing his successor became effective Nov. 1.

Prior to his appointment as general manager of the Chicago, Aurora & Elgin three years ago, he had been connected with the Chicago Rapid Transit Lines for twenty years. Following his graduation from Cornell University, he went to work in the shops of the Chicago elevated lines. His ability was soon recognized, resulting in rapid promotion from one position to another. When the country entered the World War in 1917, Colonel Blair, who at that time was chief electrical engineer for the elevated system, volunteered his service and received a commission in the 311th Engineers. He quickly rose to captain and major and his regiment was ordered overseas, where it was an important unit in the construction of railroads in France. On his retirement from the Army with the rank of colonel, he returned to the Chicago Rapid Transit Lines and was made assistant to Britton I. Budd, president of the elevated system and of other electric railways entering Chicago. In that capacity he had an opportunity to acquire intimate knowledge of the transportation problems in the Chicago metropolitan area, not only of the operations, but also of the financial plans of the railroad.

As negotiations are now under way between the transportation companies and the city of Chicago with a view to effecting a merger of surface, elevated and bus lines and the building of a downtown subway, the wide experience of Colonel Blair makes his services indispensable to the company committees engaged in this work.

Mr. Egolf, who succeeds Colonel Blair, is well known in electric railway operations in metropolitan Chicago. For several years he was manager of the Aurora, Elgin & Fox River Electric Railway, leaving that position for a time to become general manager of the North Shore Line. He resigned that position last year to return to Aurora as vice-president of the Western United Company. Mr. Egolf will remain in his present position with the gas and electric utility in addition to the active operation and management of the Chicago, Aurora & Elgin.

## Changes in Stone & Webster, Inc., Organization

Walter H. Burke has resigned as district manager of the companies under the executive management of Stone & Webster, Inc., in the Southwestern district, and is returning to the East.

Effective Jan. 1, 1928, James F. McLaughlin has been appointed to succeed Mr. Burke as district manager of the companies in the Southwestern district comprising the properties located in Texas, Louisiana, New Mexico and Mexico.

Tom P. Walker, vice-president of Virginia Electric & Power Company, is to be transferred from Norfolk to Richmond and, effective Dec. 1, 1928, will

be in general charge of all operations of the company, succeeding Mr. McLaughlin.

Joseph Bowes, formerly manager of the El Paso Electric Company, El Paso, Tex., has been transferred to the Virginia Electric & Power Company and will assume charge of the Norfolk division of that company, effective Dec. 1, 1928.

Francis J. Gannon, formerly assistant treasurer and secretary of Davis Islands, Inc., Davis Islands, Tampa, Fla., and previous to that assistant treasurer for varying periods of time of various of the companies under the executive management of Stone & Webster, Inc., has been appointed, effective Nov. 15, 1928, manager of El Paso Electric Company (Texas corporation), El Paso & Juarez Traction Company, Rio Grande Valley Traction Company and Mesilla Valley Electric Company.

## J. F. Gilchrist Formally Resigns

John F. Gilchrist, chairman of the New York Transit Commission, tendered his resignation to Governor Smith, effective Nov. 15. Mr. Gilchrist resigns in order to accept an attractive business offer. The Governor has accepted Mr. Gilchrist's resignation. The latter's activities in the regulatory field and his new business connection were mentioned in ELECTRIC RAILWAY JOURNAL, issue of Oct. 13, 1928.

## New Division Manager of Northern States

Glen V. Rork has been appointed manager of the Wisconsin division of the Northern States Power Company, with headquarters at Eau Clair, Wis. For a number of years after his graduation from college at Ripon, Wis., in 1910, he was employed in various branches of electrical work for one of the operating subsidiaries of the Northern Pacific Railroad.

Mr. Rork entered the employ of the Wisconsin-Minnesota Light & Power Company, now the Wisconsin division of Northern States Power Company, in 1920. Following the purchase of the Midland Public Service Company, with headquarters at Owen, Wis., by the Northern States Power Company, Mr. Rork developed that company's system from a five-town unit to its present size of 23 towns.

Mr. Rork, whose appointment was announced by R. F. Pack, vice-president and general manager, was born at Reedsburg, Wis.

Since the resignation of George H. Wilmarth as manager of the Wisconsin division of Northern States Power Company, to become chief operating engineer of the company, with offices in Minneapolis, Harold L. Geisse, vice-president and general manager of Wisconsin Valley Electric Company, has supervised operations of the Wisconsin division.

## W. L. Haymond Promoted by Brill

Wirt L. Haymond, assistant sales manager of the American Car Company, St. Louis, since 1918, was appointed sales manager, effective Oct. 1. In this position he succeeds F. A. Richards, whose resignation to become president of the Metropolitan Railway Equipment Company, St. Louis, was announced in the ELECTRIC RAILWAY JOURNAL issue of Oct. 20.

Mr. Haymond has grown up in the Brill organization. Starting in December, 1897, when only sixteen years of age, his early activities were devoted to the accounting division of the Brill plant in Philadelphia. In 1902 he was transferred to the American plant and placed in charge of the time and cost departments. From 1908 until 1918, when he became assistant sales manager, he acted as chief clerk to the general manager.



W. L. Haymond

By training and experience Mr. Haymond is well fitted to "head up" the sales organization of the American Car Company. His close association with the sales activities of the company for so many years assures the industry the same careful consideration which its equipment problems have always received in the past. He is a member of various local activities in St. Louis, including the Missouri Athletic Association, Westborough Country Club, the Chamber of Commerce, the Traffic and the Birney Clubs.

## Promotions on West Penn System

William R. Hinchman, formerly assistant treasurer and assistant secretary of the American Water Works & Electric Company, Inc., has been elected treasurer of the West Penn Electric Company and will be permanently located in Pittsburgh. Mr. Hinchman has been connected with the "American" system for seven years, having started in the New York office in May, 1921. He worked during different periods at the Chattanooga, Little Rock, and South Pittsburgh plants where he conducted efficiency tests, and subsequently joined the treasury department in New York. In February, 1926, he was made assistant treasurer and assistant secretary.

D. P. Guest has been promoted from senior assistant treasurer of the West Penn Power Company and West Penn Railways to treasurer of both companies. He will continue as assistant treasurer of the West Penn Electric Company. Mr. Guest became associated with the West Penn Oct. 10, 1927.

LUKE C. BRADLEY of the Electric Bond & Share Company plans to spend about three months abroad soon, principally in South American countries, in an inspection of the utility properties of the American & Foreign Power Corporation, which is under Electric Bond & Share auspices. The properties controlled include electric railway, electric light and power plants, waterworks and telephone installations.

W. A. BUTTRICK, president of the Twin State Gas & Electric Company, Boston, Mass., has been elected chairman of the New England Bureau of Public Service Information. D. D. BARNUM, president of the Boston Consolidated Gas Company, is vice-chairman, and JOSEPH B. GROCE, of the Edison Electric Illuminating Company of Boston, is treasurer.

# OBITUARY

MURRY A. VERNER, 76 years old, formerly prominent in the political and business life of Pittsburgh, and interested at one time in a number of electric railways, many of which he financed in the early days of the application of electricity as motive power to city and suburban lines, died on Nov. 3. He was born on the site now occupied by the Fort Pitt Hotel in Pittsburgh.

FRANK WALTER STEVENS, consulting valuation counsel for the New York Central Lines, died in Covina, Cal., on Nov. 8. In 1907 he was appointed chairman of the Public Service Commission of the Second District of New York, serving until 1913 when he became valuation counsel for the New York Central lines. He continued in this capacity until 1924, when he was appointed consulting valuation counsel. In addition to these activities he was known for his work "The Beginnings of the New York Central Railroad," covering the history of the steam railroads traversing the territory of the Hudson River, Buffalo, and the Niagara River. These roads were consolidated in 1853 into the New York Central Lines. Mr. Stevens was born in Leon, N. Y., 81 years ago. He was graduated from the Harvard Law School and later began practice in Jamestown, where he served as local attorney for the New York Central.

W. H. MAY, vice-president of the Shuler Axle Company, died on Oct. 30. Mr. May was 80 years of age and had been an executive of the Shuler company for the past eight years. He had been prominent in business circles of Louisville and was formerly president of the National Casket Company.

# More Large Orders for Heavy Equipment to Be Made

**$20,000,000 electrification authorized by Reading Railroad. Bids for 100 coaches to be asked immediately. Equipment market continues good**

EXPENDITURE of $20,000,000 for electrification of most of the Reading Railroad within the Philadelphia metropolitan district has been authorized by the directors, according to announcement made by Andrew T. Dice, president of the company.

It is expected that bids on the preliminary work of the electrification, as well as the construction of 100 cars, will be asked within the next two or three weeks. The road distance of the branches to be converted is 49.9 miles, and will include 110 miles of actual track to be electrified.

It is indicated that the program includes the electrification of all four main tracks between Reading Terminal and Wayne Junction, and the two tracks from Wayne Junction to Lansdale from Langhorne and Chestnut Hill. Service on these lines will be increased about 25 per cent and the speed of travel increased from 20 to 24 per cent.

### Overhead Single-Phase System

Like the Pennsylvania electrification, it is planned in this project to use single-phase alternating current at 11,000 volts. Overhead trolley wires will be installed and pantographs will be used on both cars and locomotives. The lines will be supported by steel bridges at intervals of about every 300 ft.

Active progress is now being made on the detailed plans required. Erection of the catenary overhead will be the first physical work undertaken, and it is planned to begin construction at outlying points. The work will then proceed toward the more congested part of the railroad system. A number of substations will be built at various points for the most effective and reliable distribution of power to all parts of the system.

The coaches are to be of the multiple-unit type, and will release 35 steam locomotives in use, and also 120 coaches will be diverted to service in other points on the system. The new arrangement will provide express service to the outlying territory throughout the day instead of providing only local service at certain times, as at present.

At Wayne Junction, a large car storage yard and electrical repair shop will be erected on the ground between Chestnut Hill and Tavor branches, and immediately north of Wayne Junction station. The railway has already purchased ground at this location. Coincident with the electrification, the railway will install color light signals in the entire territory, replacing the present semaphore signals.




**Electrification of Reading Railroad has been authorized in the Philadelphia metropolitan area at a cost of $20,000,000**

This program, to be completed in three years, is a start toward the eventual electrification of virtually the entire system, including the New York division. According to Mr. Dice, the installation of electric trains on the Schuylkill Valley branch to Reading and Pottsville might be expected to follow the completion of the present undertaking; it was felt unlikely, however, that any definite announcement about electrification of this branch or the New York division would be made before completion of the first routes.

### Reading's Forward Step

ANNOUNCEMENT by the Reading company of its program for the electrification of all its lines within the metropolitan district of Philadelphia marks another forward step in the progress of modern transportation that will be of great benefit to the entire community. Upon its completion this work will result in an increase of the Reading's suburban train service, a marked shortening of time for commuters, and, of course, in a material reduction in the smoke and dust menace. Philadelphians will not overlook the significance of the fact that this program involves the substitution of electric for steam power on all the main lines of the company.

The Reading company, by this decision, puts itself in the van in a movement in the transportation world that is bound to cover the entire country. With the electrification of the entire suburban service of the Reading and Pennsylvania systems, this city will possess transportation facilities unsurpassed anywhere—*Philadelphia Ledger.*

### Track Purchases

Track purchases through the past month have been fairly large. Pittsburgh Railways, Pittsburgh, Pa., has placed orders for 10,000 6 in. x 8 in. x 8 ft. ties, 10,000 tie plates, 20 pairs of switch points, 20 kegs of tierod washers, six switch stands, one car of molding sand, 5,000 tierods, three cars of ½-in. Ligonier screenings, and 40 kegs of track bolts of various sizes.

Arkansas Power & Light Company, Little Rock, Ark., has placed orders for one double-track electric over steam road crossing, and one single-track electric over steam road crossing. This company has also ordered material consisting of frogs, switches, mates, and curved rail for seven jobs in Little Rock, Ark., at an approximate cost of $6,000.

Lehigh Valley Transit Company, Allentown, Pa., has ordered one standard model 38-B Barber-Greene snow loader. The St. Louis Public Service Company, St. Louis, Mo., has installed double tracks in conjunction with the widening and repaving of Franklin Avenue between Third and High Streets.

### Line Materials Ordered

Considerable line material has been ordered recently, according to reports received from several railways. The Lehigh Valley Transit Company, Allentown, Pa., has placed orders for three miles of 00 grooved copper trolley wire, 10,280 ft. of ¼-in. galvanized steel strand wire, and 5,000 ft. of ⅜-in. galvanized steel strand wire. Arkansas Power & Light Company has ordered 6,000 lb. of trolley wire, 600 lb. of 0000 clinch ears, 50 lb. of 0000 hangers and three 20-in. frogs.

Pittsburgh Railways, Pittsburgh, Pa., has ordered 200 72-in. 0000 type CAE bonds, 500 46-in. CAE type bonds, and 500 40-in. CAE bonds. This company has also ordered 5,000 15-in. 00 champion line ears, 25,000 ft. ¼-in. dead soft-annealed galvanized wire, six electric track switches with type T-3 ground boxes, and electric circuit changers, and has let a contract for the purchase of four blocks track circuit type APB signals, and one block track circuit facing signals between Boggs Passing Siding, and South Bank Stop. Another contract has been let for the purchase of ten tracks circuit type spacing signals for use on the interurban system.

Ten sets of door and step engines have been ordered by the Lehigh Valley Transit Company. Other car equipment and supplies ordered by this company include fifty 34-in. forged steel wheels, 2,000 variable size brake pins, and sixteen sets of armature coils. The Arkansas Power & Light Company has ordered four 16-passenger city type buses at an approximate cost of $18,000.

The Pittsburgh Railways has remodeled seven 4300 type low floor center entrance cars for one-man operation. This company has also just received the last of its order of fifteen interurban cars.

The Pittsburgh Railways has also let a contract for the purchase of a high-tension oil circuit breaker and structure with one spare breaker unit for its Broad Street substation. Shop equipment ordered by the Lehigh Valley Transit Company includes three frame unit heaters and three air vents.

In Canada, the London & Port Stanley Railway, London, Ontario, has been authorized to build an additional track across Bridge Street, to rearrange yard tracks, and to build a connecting track crossing Bessie Street, Port Stanley, Ontario.

The Regina Municipal Railway, Regina, Saskatchewan, is considering the extension of its car service from the northwest section of the city to the heart of the industrial area, which will involve a track installation costing about $75,000.

British Columbia Electric Railway, Vancouver, B. C., has let a contract for a cable subway in the vicinity of Point Grev substation at an approximate cost of $9,000. Calgary Municipal Railway, Calgary, Alberta, has ordered two cars and a snow sweeper.

## ELECTRIC RAILWAY MATERIAL PRICES—NOV. 13, 1928

### Metals—New York

| | |
|---|---|
| Copper, electrolytic, cents per lb | 15.775 |
| Lead, cents per lb | 6.35 |
| Nickel, cents per lb., ingot | 35.00 |
| Zinc, cents per lb | 6.60 |
| Tin, Straits, cents per lb | 50.00 |
| Aluminum, 98 or 99 per cent, cents per lb. | 23.90 |
| Babbitt metal, warehouse, cents per lb.: | |
| Commercial grade | 53.00 |
| General service | 31.50 |

### Bituminous Coal

| | |
|---|---|
| Smokeless Mine Run, f.o.b. vessel, Hampton Roads, gross tons | 4 375 |
| Somerset mine run, f.o.b. mines, net tons | 1.875 |
| Pittsburgh mine run, Pittsburgh, net tons | 1 8 |
| Franklin, Ill., screenings, Chicago | 1.35 |
| Central, Ill., screenings, Chicago | 1 00 |
| Kansas screenings, Kansas City | 1.625 |

### Track Materials—Pittsburgh

| | |
|---|---|
| Standard steel rails, gross ton | $43.00 |
| Railroad spikes, drive, ⅝ in. and larger, cents per lb | 2.80 |
| Tie plates (flat type), cents per lb | 2.15 |
| Angle bars, cents per lb | 2.75 |
| Rail bolts and nuts, cents per lb | 3.90 |
| Steel bars, cents per lb | 1.95 |
| Ties, white oak, Chicago, 6 in. x 8 in. x 8 ft. | $1.40 |

### Hardware—Pittsburgh

| | |
|---|---|
| Wire nails, base per keg | 2.55 |
| Sheet iron (24 gage), cents per lb | 2.75 |
| Sheet iron, galvanized (24 gage), cents per lb. | 3.55 |
| Galvanized barbed wire, cents per lb | 3.20 |
| Galvanized wire, ordinary, cents per lb. | 3.00 |

### Waste—New York

| | |
|---|---|
| Waste, wool, cents per lb | 18. |
| Waste, cotton (100 lb. bale), cents per lb.: | |
| White | 17.25 |
| Colored | 13.5 |

### Paints, Putty and Glass—New York

| | |
|---|---|
| Linseed oil (5 bbl. lots), cents per lb | 10.3 |
| White lead in oil (100 lb. keg), cents per lb. | 13.25 |
| Turpentine (bbl. lots), per gal | $0.65 |
| Putty, 100 lb. tins, cents per lb | 5.725 |

### Wire—New York

| | |
|---|---|
| Copper wire, cents per lb | 17.875 |
| Rubber-covered wire, No. 14, per 1,000 ft. | 5.3 |
| Weatherproof wire base, cents per lb | 17.125 |

### Paving Materials

| | |
|---|---|
| Paving stone, granite, 5 in., f.o.b. New York—Grade 1, per thousand | $150 |
| Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd., f.o.b. | $2.70 |
| Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots, f.o.b. | 51.00 |
| Paving brick 3x8½x4, N. Y., per 1,000 in carload lots, f.o.b. | 45.00 |
| Crushed stone, ¾-in., carload lots, N. Y., per cu.yd., delivered | 3.375 |
| Cement, Chicago consumers' net prices, without bags, f.o.b. | 2.05 |
| Gravel, ¾-in., cu.yd., delivered | 3.375 |
| Sand, cu.yd., delivered | 2.125 |

### Old Metals—New York and Chicago

| | |
|---|---|
| Heavy copper, cents per lb | 13.375 |
| Light copper, cents per lb | 11.625 |
| Heavy yellow brass, cents per lb | 7.875 |
| Zinc, old scrap, cents per lb | 3.25 |
| Lead, cents per lb. (heavy) | 5.125 |
| Steel car axles, Chicago, net ton | $15.75 |
| Cast iron car wheels, Chicago, gross ton | 14.375 |
| Rails (short), Chicago, gross ton | 17.50 |
| Rails (relaying), Chicago, gross ton (65 lb. and heavier) | 28.50 |
| Machine turnings, Chicago, gross ton | 7.75 |

## 120 Buses Bought for Service in Detroit

The Detroit Municipal Railway, Detroit, Mich., has contracted to buy 120 buses. Ninety will be 16-passenger Graham-Dodge coaches at $4,535 per unit. Deliveries are to be made at rate of four a day. The city will pay 20 cents a mile for each coach for the first 120 days and thereafter 11½ cents a mile until the purchase price has been paid.

Fifteen will be 40-passenger single-deck metropolitan type made by the American Car & Foundry Company costing $10,962 each, to be delivered at once and paid for on time, and fifteen are 40-passenger buses of the Twin Coach Company costing $12,550 each, to be bought under the same arrangement and to arrive by Dec. 1.

Representatives have been sent to Chicago to study a 10-passenger bus, 50 of which may possibly be purchased.

## North Shore Receives Three New Cars

The Chicago North Shore & Milwaukee Railroad, Chicago, Ill., has recently received and placed in regular service between Chicago and Milwaukee two additional dining cars and one parlor observation car built by the Pullman Car & Manufacturing Corporation.

Delivery of this new equipment brings the total of new all-steel cars placed in service by the North Shore Line this year to eighteen. Fifteen passenger motor cars incorporating many advanced features for passenger comfort and safety, including plush-covered bucket type seats were delivered by the same manufacturer during the spring and summer.

The three cars just placed in service are modishly designed. The diners, seating 24 persons each, are finished in buff paint with walnut panels and have ornamental sidelights. The parlor-observation car has seventeen revolving easy-chairs, upholstered in light blue frieze plush. The walls are finished entirely in walnut. On the floors of both the parlor car and the diners is black and gold carpeting, with felt padding underneath. The observation platform in the rear is entirely enclosed with glass.

Including these latest cars the North Shore Line this year has added new freight and passenger equipment costing over $900,000. Other rolling stock includes ten light-weight double-truck Safety cars for Milwaukee and Waukegan city service, two new electric freight locomotives, fifteen additional steel semi-trailers for handling door-to-door merchandise despatch shipments and three 5-ton tractors for hauling trailers to and from freight receiving stations.

## Detroit Car Award Stands

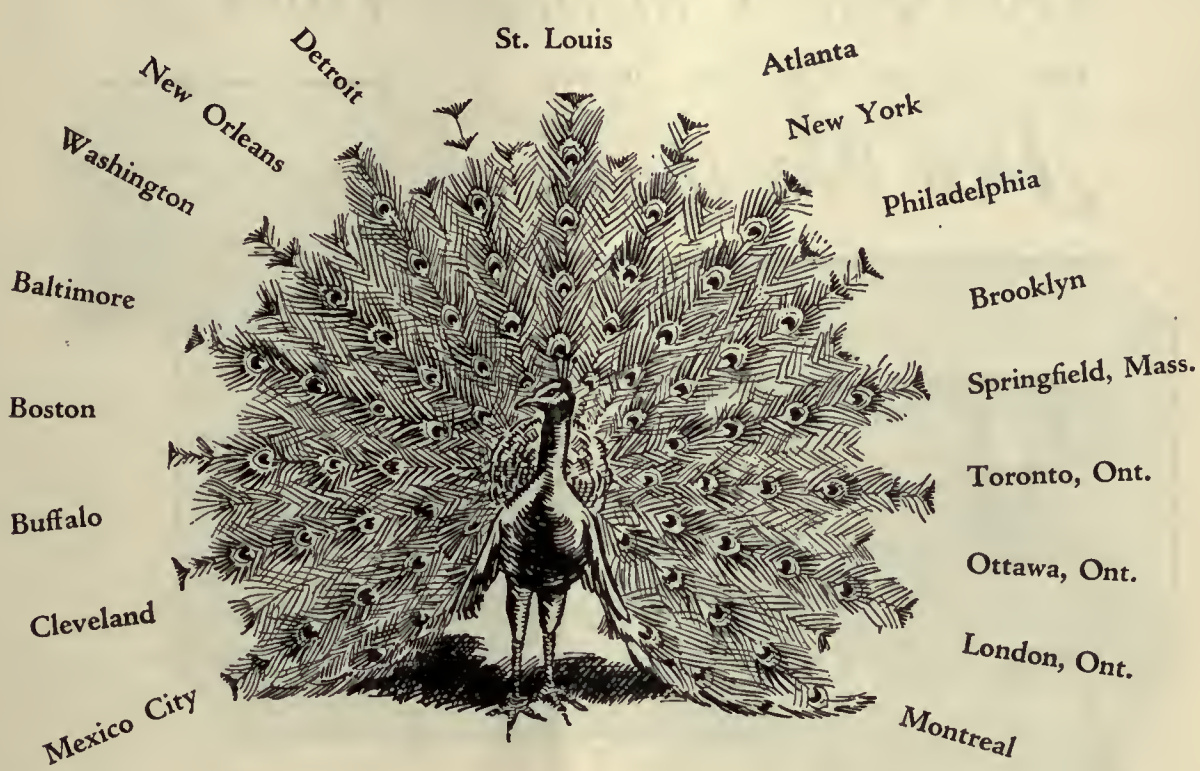
Circuit Court Judge Gilbert has dismissed the suit to secure a permanent injunction restraining the city of Detroit from carrying out a contract to buy 100 street cars from the Perley A. Thomas Company, High Point, N. C. A temporary restraining order was dissolved.

## ADVERTISING LITERATURE

Anaconda Copper Mining Company, through its subsidiary, the American Brass Company, Waterbury, Conn., is rebuilding its electrical cable plant at Hastings-on-Hudson, New York, N. Y. This plant will be constructed to produce quality power cable of all types. A testing laboratory for advanced high-tension cable work and for the examination of insulating oils, paper and cable sheath is being provided. The Hastings plant, was originally operated by the National Conduit Cable Company.

Money-Meters, Inc., Detroit, Mich., has published a booklet on modern fare collection describing the use and advantages of Money-Meters products.

# Throughout North America




# Peacock Staffless Brakes

Throughout Canada, the United States and Mexico, Peacock Staffless Brakes are recognized as standard in electric railway operations. Their greater power, speed, and unlimited capacity for chain, their weight and space saving features and their lack of maintenance are making transportation safer and less costly from the Panama Canal to Hudson Bay.





**National Brake Company, Inc.**

890 Ellicott Square Buffalo, N. Y.

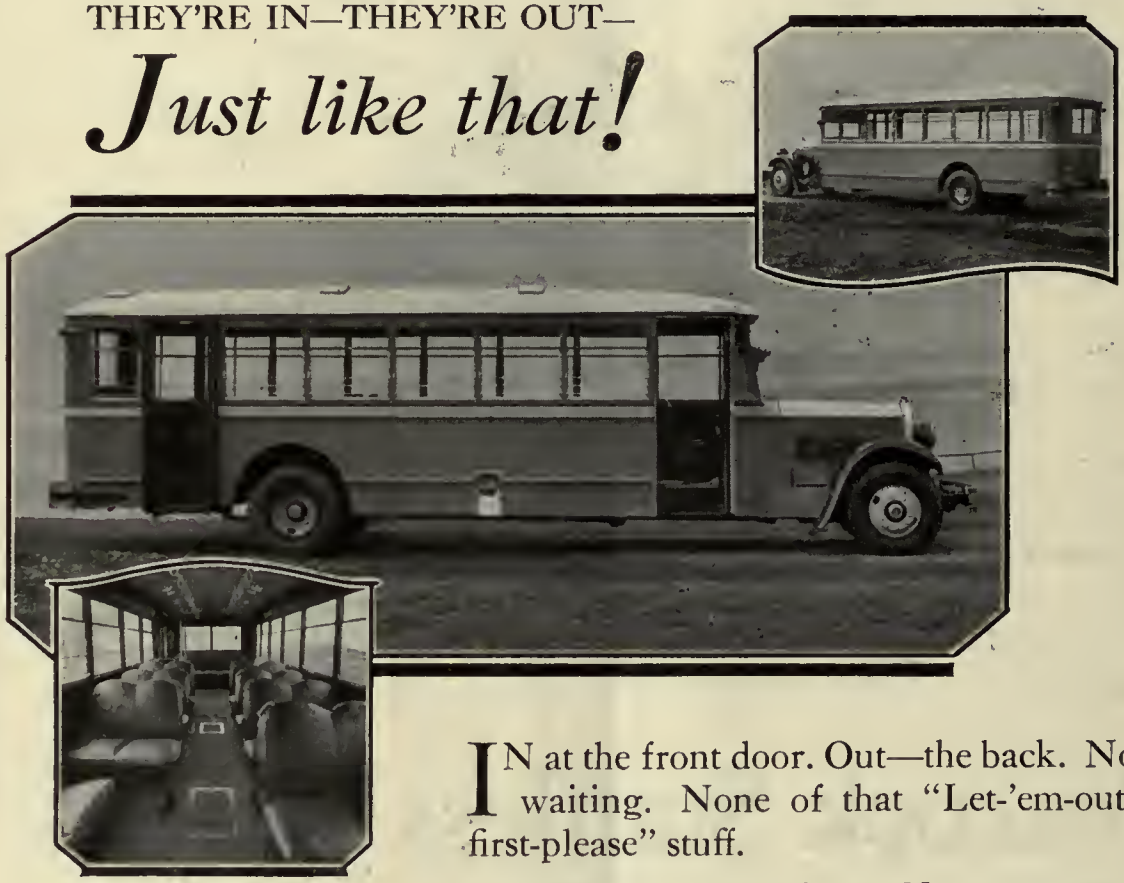
*Canadian Representative*
Lyman Tube & Supply Co., Ltd., Montreal, Can.
The Ellcon Company—General Sales Representatives
50 Church St., New York

# LOADING & UNLOADING

## *Quick as Closing a Door . . .*

THEY'RE IN—THEY'RE OUT—

## *Just like that!*



Door at right front—two-piece Jack-knife type; actuated by National Pneumatic Air Engine. Right rear exit door is double fold or four-piece type—actuated by combination Pneumatic Air Engine with treadle step.

Bus cannot start unless both doors are properly closed. Emergency door at left rear also.

IN at the front door. Out—the back. No waiting. None of that "Let-'em-out-first-please" stuff.

A pay-enter type. Seats 29 passengers. Holds a lot more. Wide comfortable aisle for standees. No stooping for the six-footers.

Seats as restful as a davenport. Windows wide, clear and non-rattling. Plenty of ventilation. Lights non-glaring. Heating O. K.

**More information upon request. Write *today*. Learn more about this profit maker for your business.**

## THE BENDER BODY COMPANY

W. 62nd and Denison Cleveland, Ohio

# BENDER BODIES

# . . . and you get what's left!

SO much for depreciation—
SO much for insurance—
SO much for drivers and mechanics—
SO much for fuel—
SO much for tires—

An army of costs working against a single friend . . . INCOME.

By its famous Water-Curing Process, Goodrich enables you to reduce one cost and earn more profit . . . tires. This process—an extra one—applied to Silvertowns lengthens mileage to a new figure and double-strengthens the high quality rubber. Tire failure is practically wiped out of the transportation picture.

More and more . . . it's Silvertowns "all-round" with big bus lines. Try them—test them for dependability and economy.

THE B. F. GOODRICH RUBBER COMPANY
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Specify Goodrich on your next Truck or Bus

# Goodrich
## HEAVY DUTY
# Silvertowns
HIGH PRESSURE OR BALLOON




**Indication**
Publicly indicates to passengers in the car the amount and kind of each fare and zone from and to. An important protective feature.

**Operator's Key**
Each operator has his own key without which the machine is inoperative.

**Printed Ticket**
Tickets printed by the machine from plain stock protect receipts and cut cost of tickets.

**Fast Key Board**
An important and exclusive feature of this machine. A big factor in fast and accurate operation.

**Printed Trip Sheet**
A permanent, printed and locked up record of every fare collected.

**Repeat Key**
Enables operator to issue any number of tickets of same amount by pressing repeat key.

**Printed Total**
Total of all cash receipts printed on trip sheet and receipt by simply moving lever to "Read" position.

**Ticket Holder**
A convenient method of holding tickets as they are turned in by passengers.

**Electric Motor**
Insures fast operation. Specially constructed to meet the needs of interurban operation.

# Compare these features with your present system

Every feature of the National Fare Register is essential to the proper collection of fares.

Each performs an important function in the protection of receipts and the speeding up of service.

Never before has a machine combining these essential features been available to the electric railway operator. Small in size and sturdy in construction, the National Fare Register stands up under the hardest usage.

Compare the features of this machine with those of your present system. Ask yourself if there is one feature on the National Fare Register that you can afford to do without.

Back of every machine is an organization with more than 400 offices in the United States and Canada equipped to give instant service.

Our representative in your city will be glad to give complete information on this new method of fare protection and collection.

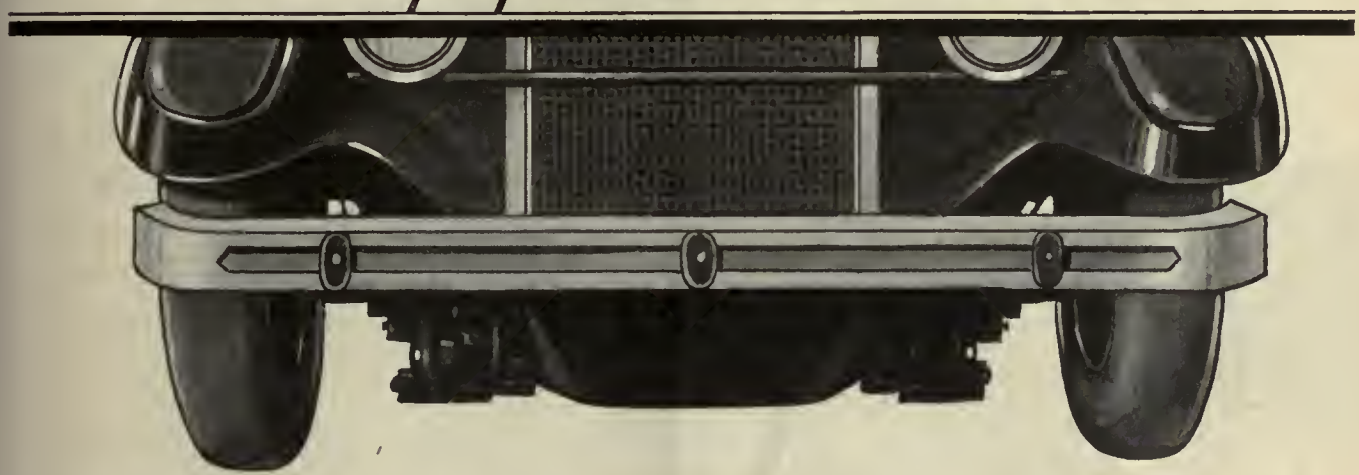
# National Fare Registers

Product of The National Cash Register Company
Dayton, Ohio




# NORTH EAST

## *Equipment for Buses*



## STARTING MOTORS · GENERATORS · IGNITION
## HORNS · SPEEDOMETERS



**Heavy Duty Bus Generators** from 225 Watt to 800 Watt capacity. Standard and special mountings and drives. Built to accommodate North East Voltage Regulation.

THERE'S a liberal "factor of safety" in NORTH EAST electrical equipment for buses—an extra measure of reserve power and ruggedness, more than enough to meet any demand. That helps explain its unfailing performance under all operating conditions, its long life, and its freedom from service troubles.

**NORTH EAST ELECTRIC CO.**

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*Service Stations all over the World*



**Starting Motors** 4½" diameter to 6 9/16" diameter. With or without internal gear reduction. Bendix drives.



**Motor-Driven Horns** with strong powerful tone and rugged construction.



**Speedometers**—quiet, rugged, accurate. Temperature compensation. With or without trip odometer. With or without glass.

**Control Units**—containing current and voltage regulator elements and cut-out. **Switch and Fuse Boxes** centralizing all connections.

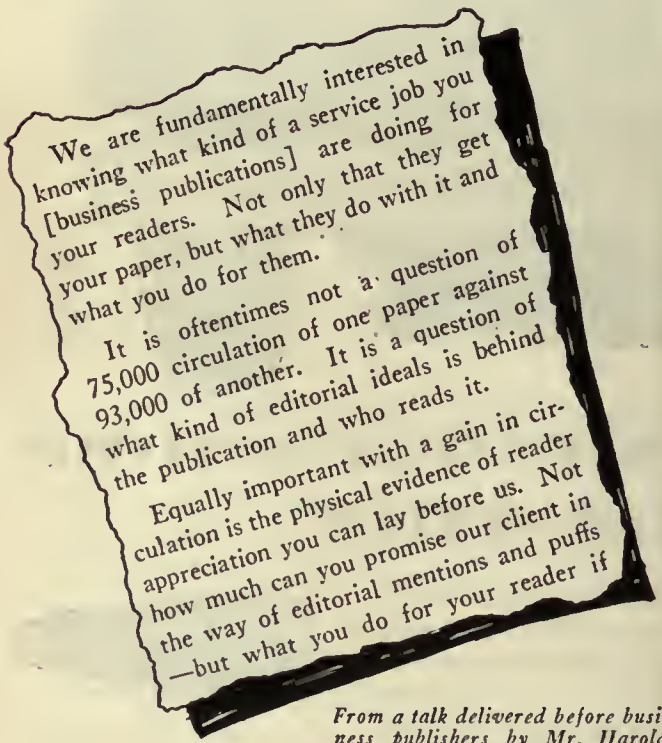
**Heavy Duty Ignition**—Ball Bearing types. Distributor and coil separate or combined. All S.A.E. types of mountings including the magneto base.



**Magnetic Type Horns** with penetrating tone of great volume. Instant response—long life.

*This is one of a series of McGraw-Hill advertisements directed originally to advertising men in an effort to make industrial advertising more profitable to buyer and seller. It is printed in these pages as an indication to readers that McGraw-Hill publishing standards mean advertising effectiveness as well as editorial virility.*

# More and more advertisers are asking this question daily




*From a talk delivered before business publishers by Mr. Harold W. Cook, N. W. Ayer & Son.*

THIS viewpoint typifies the trend from old "space-buying" methods to careful, behind-the-scenes investigation of advertising mediums . . . a trend that is welcomed by those business publishers who are insistent upon a virile, courageous editorial service to their readers.

This question, "What lies behind your circulation figures?" is easily answered by McGraw-Hill readers. Advertising men have been given a definite answer to this query in the form of a series of advertisements published during 1928, in which is described real editorial service, its objectives and results.

Our advertising agent dug deeply into McGraw-Hill editorial records to help other advertising agents and their industrial clients answer this question.

*—The publishers*

Reprints of these advertisements will be sent upon request to industrial advertisers, industrial salesmen, advertising agents, bankers and collegiate schools of marketing and advertising.

F-6



THE General distributor studies the load and operating conditions and knows how to properly fit the tire to the job. In supplying the big share of the truck and bus tire market, General has gained the widest experience in tackling the toughest jobs and assuring operators the lowest cost per tire mile. This factory experience is a big item in low-cost operation and is a part of every General dealer's service.

THE GENERAL TIRE AND RUBBER COMPANY, AKRON, OHIO



The Mark of Leading Tire Stores Everywhere

*The Heavy Express Special*

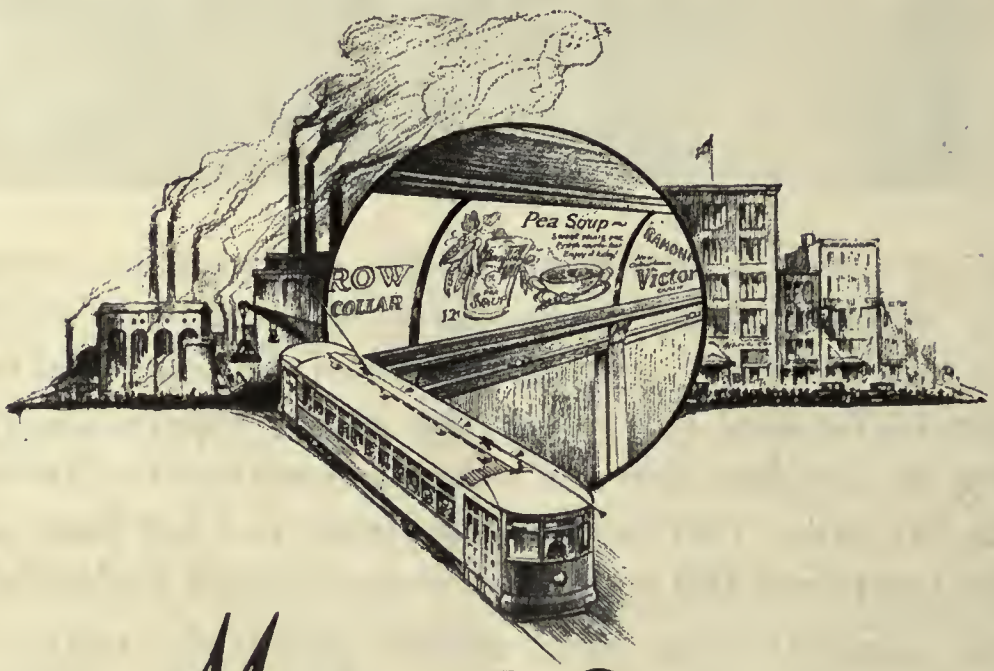
Specially built to stand up under the load at express speed, the Heavy Express Special carries through on any job. Operators everywhere are swinging to it.

*The*

# GENERAL

## TIRE

*—goes a long way to make friends*




# *Mutual Service*

TO the manufacturers and distributors of America and the street railway systems that transport the millions of America's potential buyers, Collier offers a mutual service.

This service has brought the street railway riders in thousands of cities and towns throughout the country to look upon car cards as extremely useful and pleasing features of up-to-date street car service. It has given national and local advertisers a medium thru which they can get their messages to selected territories easily, economically and convincingly.

Our business is one of service—service to the street railway industry, service to America's National and local advertisers, service to the millions of people who daily ride on street cars.




CANDLER BUILDING
NEW YORK, N. Y.




# Cold weather requires *a fighting* gasoline

ZERO weather, wind and snow—a winter combination that tests to the limit the fuel you use in your buses. Gasoline to be dependable under such conditions, must possess to a high degree every feature essential to a good gasoline—quick starting in cold weather, proper arrangement of boiling point fractions assuring maximum development of power, economical mileage.

Red Crown Gasoline meets every one of these requirements. It is noted for its quick starting qualities. Low initial boiling point assures quick vaporization, so that the spark catches promptly.

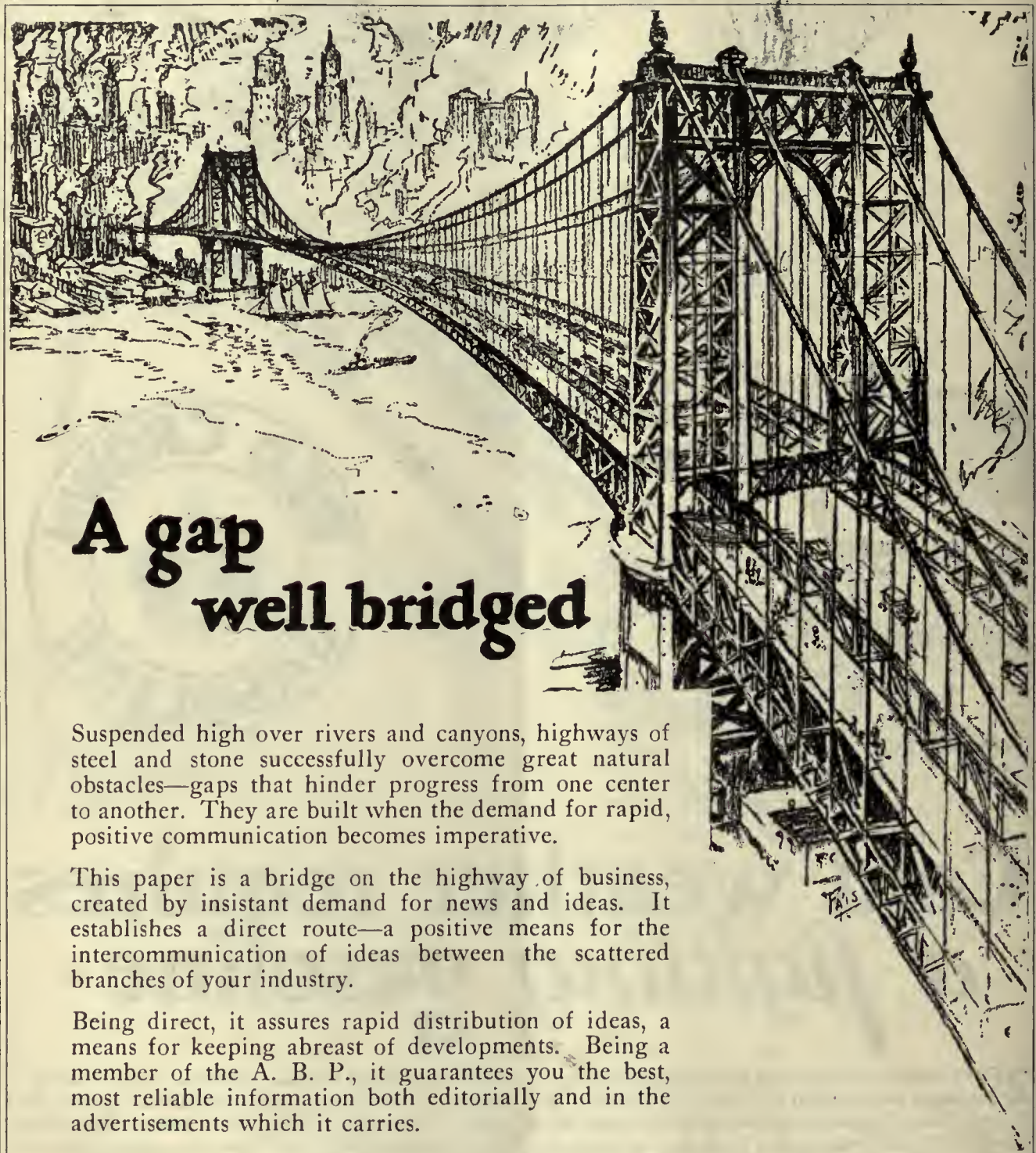
Red Crown Gasoline is further characterized by the perfection of its chain of boiling point fractions, giving quick acceleration, maximum power and clean combustion. This is why Red Crown causes less dilution of oil in cold weather, why it gives more mileage per gallon.

If you would maintain your winter schedules; if you would reduce your winter operating expenses to the lowest possible point, Red Crown as a factor in accomplishing this surely deserves your consideration. Test it in one of your buses against any other fuel—prove to yourself that it is the most efficient and economical fuel—winter or summer.

STANDARD OIL COMPANY
(INDIANA)

*General Offices:* 910 South Michigan Avenue Chicago, Ill.

811



# A gap well bridged

Suspended high over rivers and canyons, highways of steel and stone successfully overcome great natural obstacles—gaps that hinder progress from one center to another. They are built when the demand for rapid, positive communication becomes imperative.

This paper is a bridge on the highway of business, created by insistant demand for news and ideas. It establishes a direct route—a positive means for the intercommunication of ideas between the scattered branches of your industry.

Being direct, it assures rapid distribution of ideas, a means for keeping abreast of developments. Being a member of the A. B. P., it guarantees you the best, most reliable information both editorially and in the advertisements which it carries.

Take the shortest and best route to up-to-the-minute news. This A. B. P. paper leaves no gap in supplying information which is helpful to you in the conduct of your business.

THE ASSOCIATED BUSINESS PAPERS, Inc.

Executive Offices, 52 Vanderbilt Ave., New York, N. Y.

A.B.P.

*An association of none but qualified publications reaching the principal fields of trade and industry.*

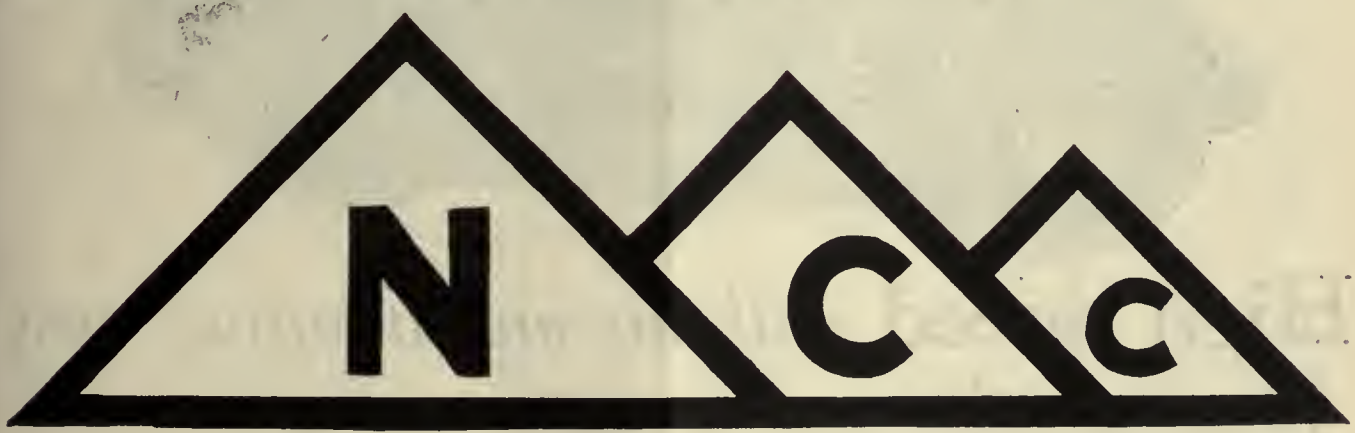
# The Data Sheet System

THROUGH our Data Sheet System we have assisted many firms in standardizing their brush requirements and reducing their brush costs. The system is installed in each case by one of our Sales Engineers, who inspects each motor, generator or converter, determining all the facts about the brush requirements of each. These essential specifications for each machine are itemized on a Data Sheet. Copies are supplied to the customer's Purchasing, Operating and Stores Departments, while we retain a copy in our files. When new brushes are needed it then is necessary merely to write, wire or phone for brushes "for the machine covered by your Data Sheet Item No. so-and-so."

Such a highly developed system as this relieves the Purchasing Agent of all responsibility for the technical specifications of brushes, about which he cannot be expected to be informed. It saves mistakes and confusion in ordering, and is assurance to everybody that the right brushes will be received at the earliest possible moment.

In installing the Data Sheet System quite often other savings of a quite different character are realized. We frequently find more types of brushes in use than are needed. In one outstanding case we were able to reduce the number of types from a thousand to about a hundred, with a resulting great saving. Again, we sometimes find wrong brushes in use, and by recommending the proper grades have made considerable reductions in up-keep costs besides increasing machine efficiency.

The Data Sheet System will be installed on request, entirely without cost to you. Write, wire or phone and a Sales Engineer will call.




NATIONAL CARBON COMPANY, INC.

*Unit of Union Carbide* UCC *and Carbon Corporation*

*Carbon Sales Division*

Cleveland, Ohio — SILVER STRAND CABLE TRADE MARK REGISTERED — San Francisco, Cal.

*Branch Offices and Factories*

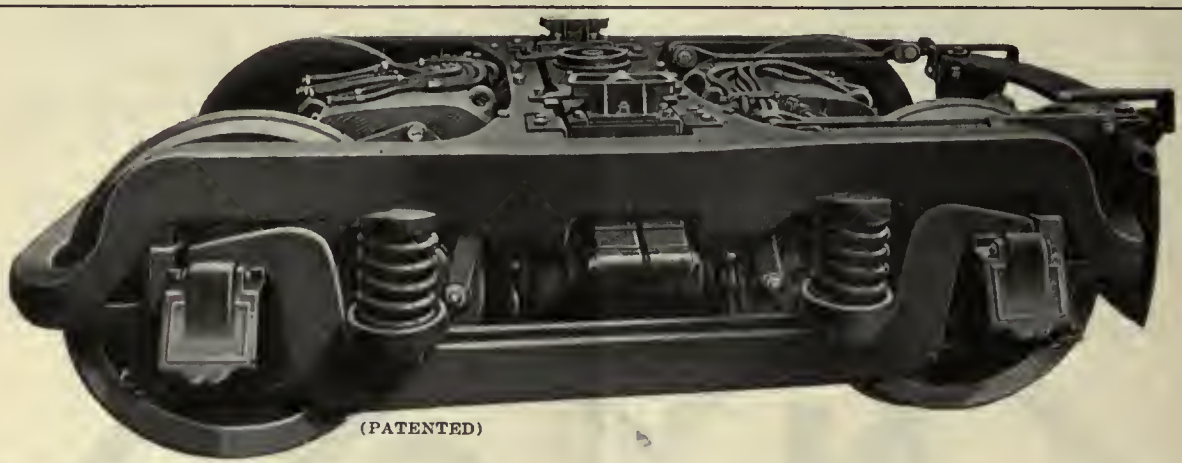
CHICAGO, ILL. PITTSBURGH, PA. JERSEY CITY, N. J. BIRMINGHAM, ALA.

# *Wherever Rails Cross*




SPECIAL
TRACK WORK

THE BUDA COMPANY
Harvey (Chicago Suburb) Illinois



(PATENTED)

# High Speed *without maintenance cost*

Designed for high-speed interurban service.

Steel frames, including cross and end transoms, cast in one strong unit.

Pedestals cast integral with frame. Removable hardened spring-steel liners protect them from wear.

Simplicity and strength of construction; excellence of design, material, and workmanship—these fundamental qualities account for the remarkably long trouble-free service of Commonwealth Trucks. And they account for the fact that many leading railways have standardized upon them.

COMMONWEALTH STEEL COMPANY, *Granite City, Ill.*

# These Advantages mean better welding at less cost!




Page Welding Wire assures uniform welds at the lowest possible cost—it saves labor, equipment and time. Prove for yourself these Page advantages. Your name and address bring free samples for test.

1. Processed
2. Flame-Tested
3. Shop-Tested
4. Uniform
5. Plainly Marked

PAGE STEEL and WIRE COMPANY
Bridgeport, Connecticut

District Offices: Chicago New York Pittsburgh San Francisco

An Associate Company of the American Chain Company, Inc., Bridgeport, Conn.

In Canada: Frost Steel and Wire Co., Hamilton, Ontario

**PAGE-ARMCO**
*Flame-tested* PROCESSED *Shop-tested*

**Welding Wire and Electrodes**

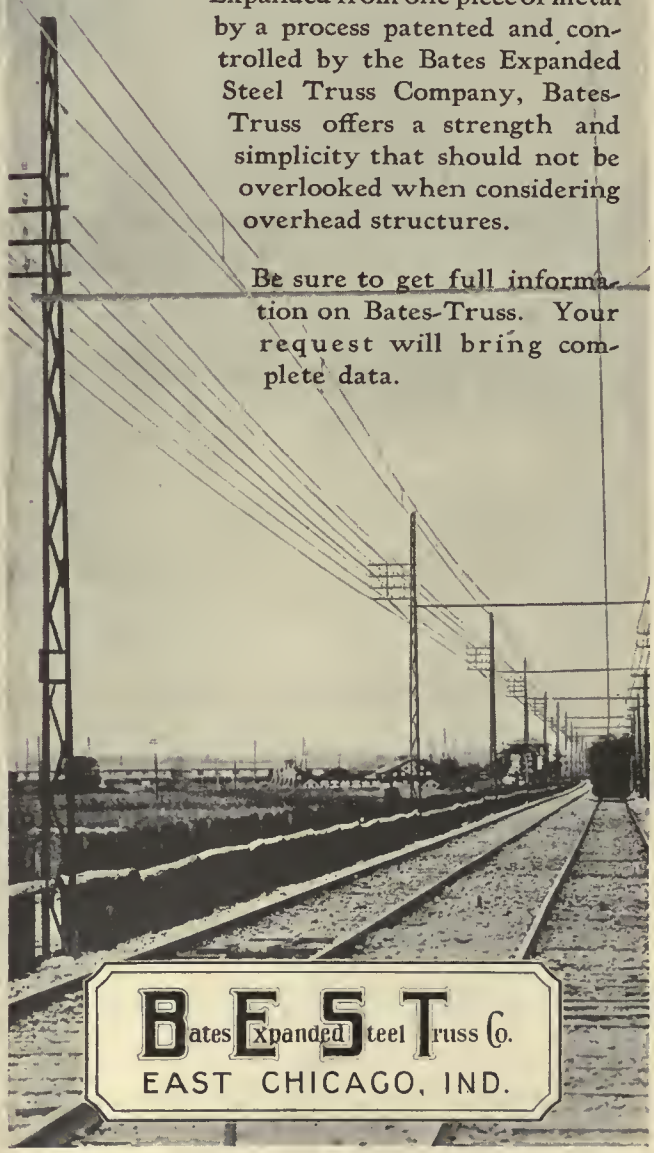
# For All Overhead Structure

## Specify "BATES-TRUSS"

LOW maintenance and erection costs --- a life time of service --- absolute satisfaction --- are a few of the reasons why electric lines and Public Utilities throughout the country are using Bates-Truss.

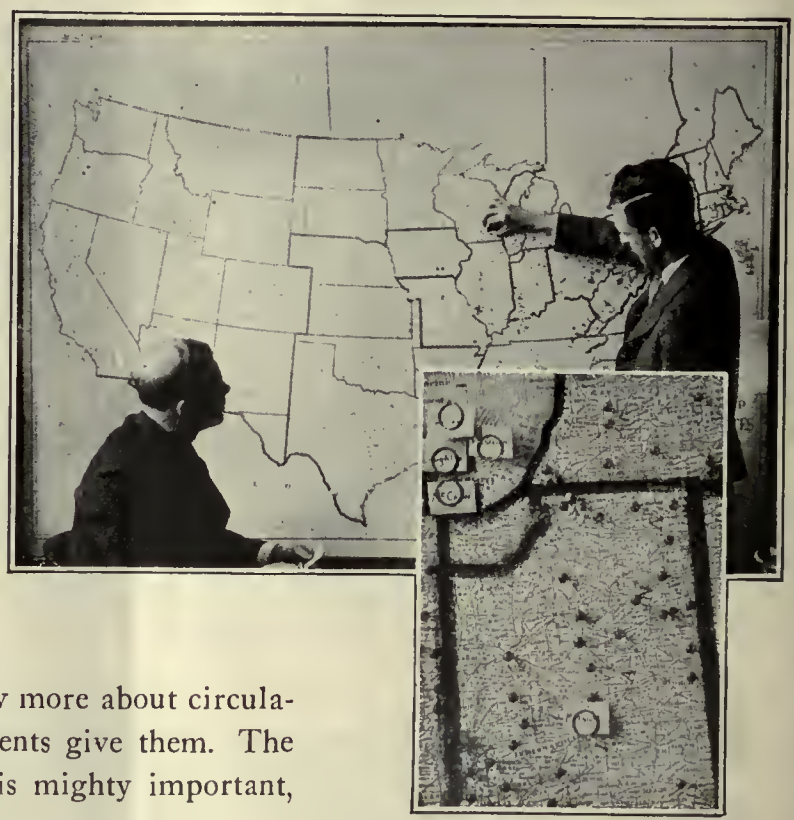
Expanded from one piece of metal by a process patented and controlled by the Bates Expanded Steel Truss Company, Bates-Truss offers a strength and simplicity that should not be overlooked when considering overhead structures.

Be sure to get full information on Bates-Truss. Your request will bring complete data.



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# *Behind the scenes of circulation building*



ADVERTISERS need to know more about circulation than circulation statements give them. The method of building circulation is mighty important, as the following questions suggest:

How do publishers locate and rate subscribing prospects? How do they get them? Why do they get them?

At McGraw-Hill circulation headquarters in New York there is a large map shown on this page. On it here and there are colored pegs which show what circulation we do not have—plants, utilities or service organizations whose buying power should be covered by a McGraw-Hill publication.

No one—publisher or manufacturer—can map his prospects in this way without continuous research.

Between 50 and 60 salaried McGraw-Hill circulation men participate in this research to locate, rate and get only the decision men of industry and business.

The McGraw-Hill circulation man is trained to help the reader subscribe to the publication that deals most intimately with his daily problems. That is why his card is open-sesame in important industrial plants throughout the country, whose policy is "no book agents admitted."

*—The publishers*

F-1

# LORAIN

Girder Rails, Special Trackwork, Switches, Frogs and Crossings in Solid Manganese Steel, Manganese Insert Construction, Chrome Nickel Steel Insert Construction and Built-up Construction of all heights and weights of rail

## The Lorain Steel Company

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

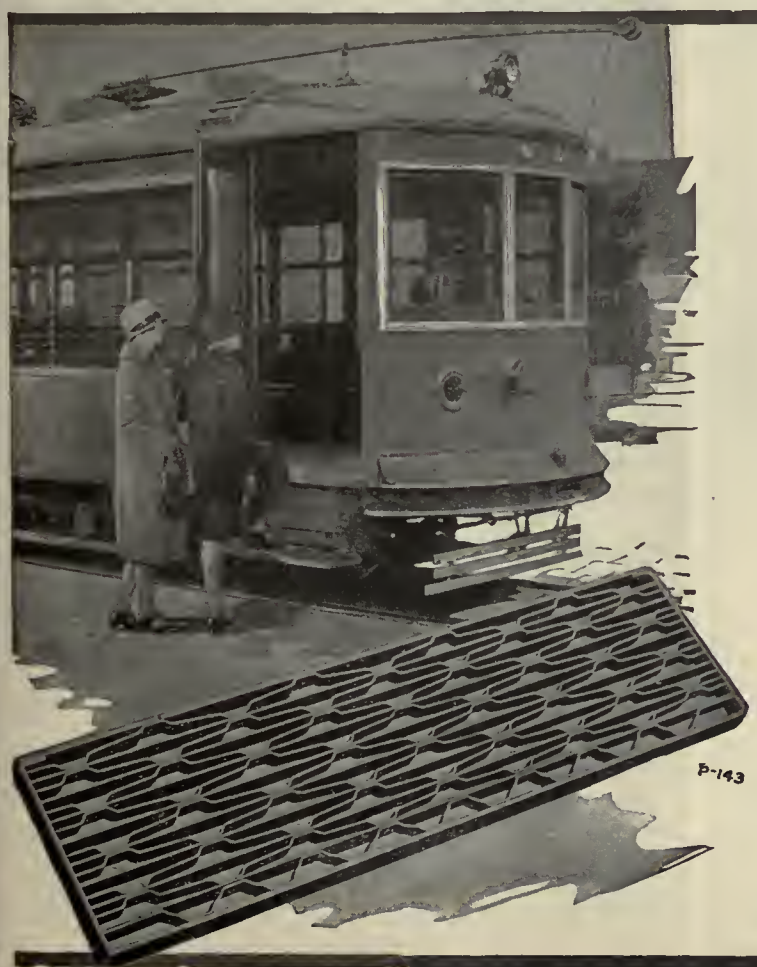
General Offices: Johnstown, Pennsylvania

*Sales Offices:*

Atlanta Chicago Cleveland Dallas New York Philadelphia Pittsburgh

Pacific Coast Representatives: U. S. Steel Products Co., San Francisco, Seattle, Portland, Los Angeles
Export Representatives: United States Steel Products Co., New York






VIZABLEDG PATENTED

# SAFKAR

TRADE MARK REG.

SAFSTEP

Claim agents and safety engineers see, in "Safkar" Steps, the solution of some of the most serious problems they meet. Always non-slipping, always "miss-proof" because of the visible edge, always clear of dust or snow, always dry —they practically eliminate costly "step accidents."

*Have you Bulletin 2D-28?*

## IRVING IRON WORKS CO.

LONG ISLAND CITY, N.Y. U.S.A.

Established in 1902

ATLANTA, GA. BALTIMORE, MD. BIRMINGHAM, ALA. BOSTON, MASS. BUFFALO, N.Y. CHICAGO, ILL. CINCINNATI, OHIO
CLEVELAND, OHIO DALLAS, TEXAS DENVER, COLO. DETROIT, MICH. EL PASO, TEXAS HAVANA, CUBA HOUSTON, TEXAS
INDIANAPOLIS, IND. KANSAS CITY, MO. KNOXVILLE, TENN. MEXICO CITY, MEX. MILWAUKEE, WIS. MINNEAPOLIS, MINN. MONTREAL, P.Q.
PHILADELPHIA, PA. PITTSBURGH, PA. ST. LOUIS, MO. SAN FRANCISCO, CAL. SALT LAKE CITY, UTAH SEATTLE, WASH. SCRANTON, PA. UTICA, N.Y.

# SHULER FRONT AXLES



A complete line for Trucks, Tractors and Trailers.

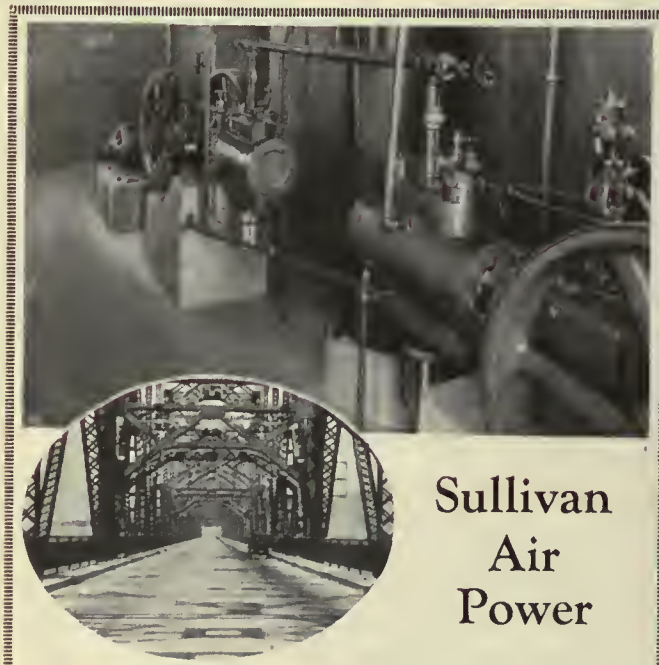
for Motor BUSSES

SHULER AXLE COMPANY

Louisville Incorporated Kentucky

*Member of Motor Truck Industries Inc. of America*





## Sullivan Air Power

### Guards World's Longest Highway Bridge

When fog blankets San Francisco Bay, ships pass the great Carquinez Bridge in safety. For fog signals blown by two 7x6-in. Sullivan "WG-6" Compressors sound warning from the center pier. The compressors are short belt driven from electric motor.

So careful was the attention given to every detail of the undertaking—that the selection of Sullivan Compressors constitutes a real tribute to the dependable service they have given industry for 20 years.

Three advantages of Sullivan "WG-6" Compressors are "Wafer" valves, automatic lubrication, and "sweep control" unloading. Sullivan Compressor Catalogs will be mailed on request.

*Angle Compounds, Catalog* 3283-J
*Single Stage, Catalogs* 3283-H, 3283-I
*Portables, Catalog* 3283-F.

Sullivan Machinery Company
150 S. Michigan Ave., Chicago



# That electrical fact you want

*—is here*

For every man in electrical work

This is the one standard electrical help containing all the data, kinks, short-cuts, helps and other information that the practical electrician, wireman, lineman, contractor, plant superintendent and construction engineer needs.

*Croft's*

American Electricians' Handbook

By TERRELL CROFT

*823 pages, flexible, pocket size, 900 illustrations. $4.00 net, postpaid*




The book is brimful of those facts which every man engaged in electrical work needs to know.

Think how much help you would be able to get from a convenient pocket-size handbook that gives you in one book—

**Practical suggestions for locating and correcting both motor and generator troubles—**

**Clear directions for proper installation and operation of motors and generators—**

**Explanations of fundamentals of practical electricity—**

**Helpful data on transformers—**

**All the details the practical man needs on wiring for light and power.**

All these topics and many more are covered in this revised second edition of Croft's Handbook.

See it FREE

*Make 1928 pay you— Mail this coupon now!*

## McGRAW-HILL FREE EXAMINATION COUPON

McGraw-Hill Book Company, Inc., 370 Seventh Avenue, New York.

Send me Croft's American Electricians' Handbook. $4.00 net, postpaid, on 10 days' approval. I agree to pay for the book or return it postpaid within 10 days of receipt.

(To secure book on approval print your name plainly and fill in all lines.)

Name .....

Home Address .....

Position .....

Name of Company .....

(Books sent on approval to retail purchasers in the U. S. and Canada only.) F. E.R.J.



# WELDERS LIKE IT!

Applied to the rail on regular, heavily beaded or weber joints . . . heavy copper terminals forged tightly around the cable effectively support the cable and dampen vibrations . . . terminals are of the same metal as cable, corrosion will not loosen the terminal grip . . . No danger of burning the cable, the copper terminal reaches a fusion temperature at the same heat as the cable . . . terminals are sheared at an angle, exposing every strand to the welding flame . . . each strand is sure to be merged into the weld with the rail . . . Welders like it!

Briefly that's the story of Erico GASW Gas Weld bonds. Prices and samples are yours for the asking. Write—

THE ELECTRIC RAILWAY IMPROVEMENT CO.
2070 E. 61st Place Cleveland, Ohio

# AMERICAN BRIDGE COMPANY

71 Broadway, New York



*Highway Bridge across Russian River at Guerneville, Cal.*

*Manufacturers of Steel Structures of all classes, particularly*

## BRIDGES AND BUILDINGS

HIGHWAY BRIDGES

POWER HOUSES BOILER HOUSES

ROOF TRUSSES COLUMNS, GIRDERS

*Offices in Principal Cities*



## Complete satisfaction

Operating perfectly and requiring minimum attention for maintenance and lubrication, Earll Catchers and Retrievers give genuinely satisfactory results. Their refinement of design, and mechanical superiority are summarized in the following five features, peculiar to Earll construction.

**No-wear Check Pawl**
**Free-Winding Tension Spring**
**Ratchet Wind**
**Emergency Release**
**Perfect Automatic Lubrication**

Earll Catchers and Retrievers

C. I. EARLL, York, Pa.

*Canadian Agents:*
Railway & Power Engineering Corp., Ltd., Toronto, Ont.
*In All Other Foreign Countries:*
International General Electric Co., Schenectady, N. Y.



TRUCK WITH TOWER IN RUNNING POSITION

## TRENTON TOWER

### This 3-Section

is not only more convenient, but stronger than the older type.

The top section is reinforced by the intermediate section. The 3-section design makes it possible to raise the platform 16 inches higher and drop it 12 inches lower than can be done with the old-style 2-section tower.

We'll gladly send you details.

## J. R. McCARDELL CO.

Trenton, New Jersey, U. S. A.




## Drip Points for Added Efficiency

They prevent creeping moisture and quickly drain the petticoat in wet weather, keeping the inner area dry.

The Above Insulator—No. 72—Voltages—Test—Dry 64,000 Wet 31,400, Line 10,000.

Our engineers are always ready to help you on your glass insulator problem. Write for catalog.

Hemingray Glass Company

Muncie, Ind.

Est. 1848—Inc. 1870

## N-A-C-H-O-D Spells Safety

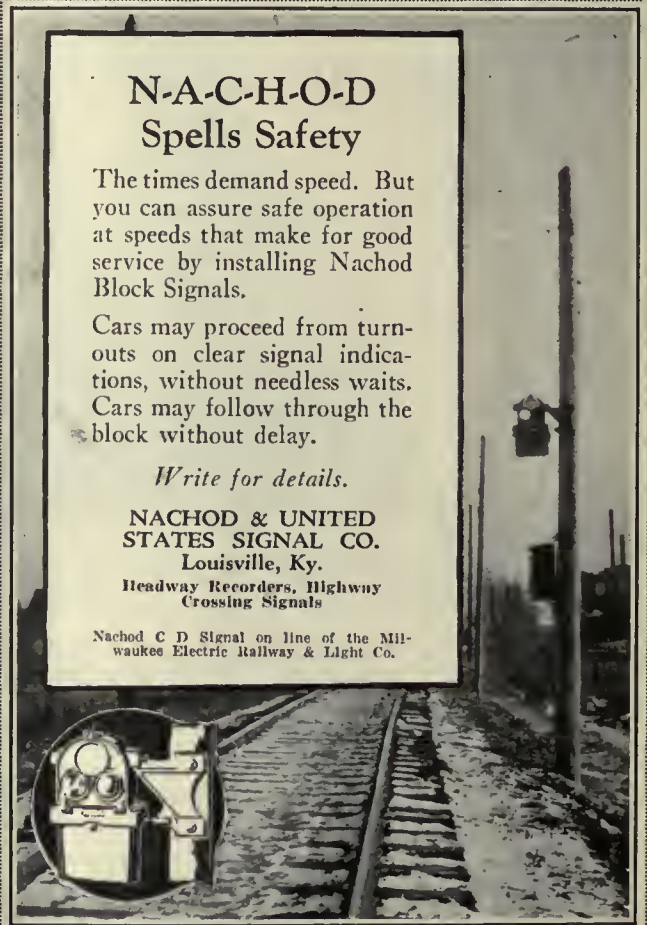
The times demand speed. But you can assure safe operation at speeds that make for good service by installing Nachod Block Signals.

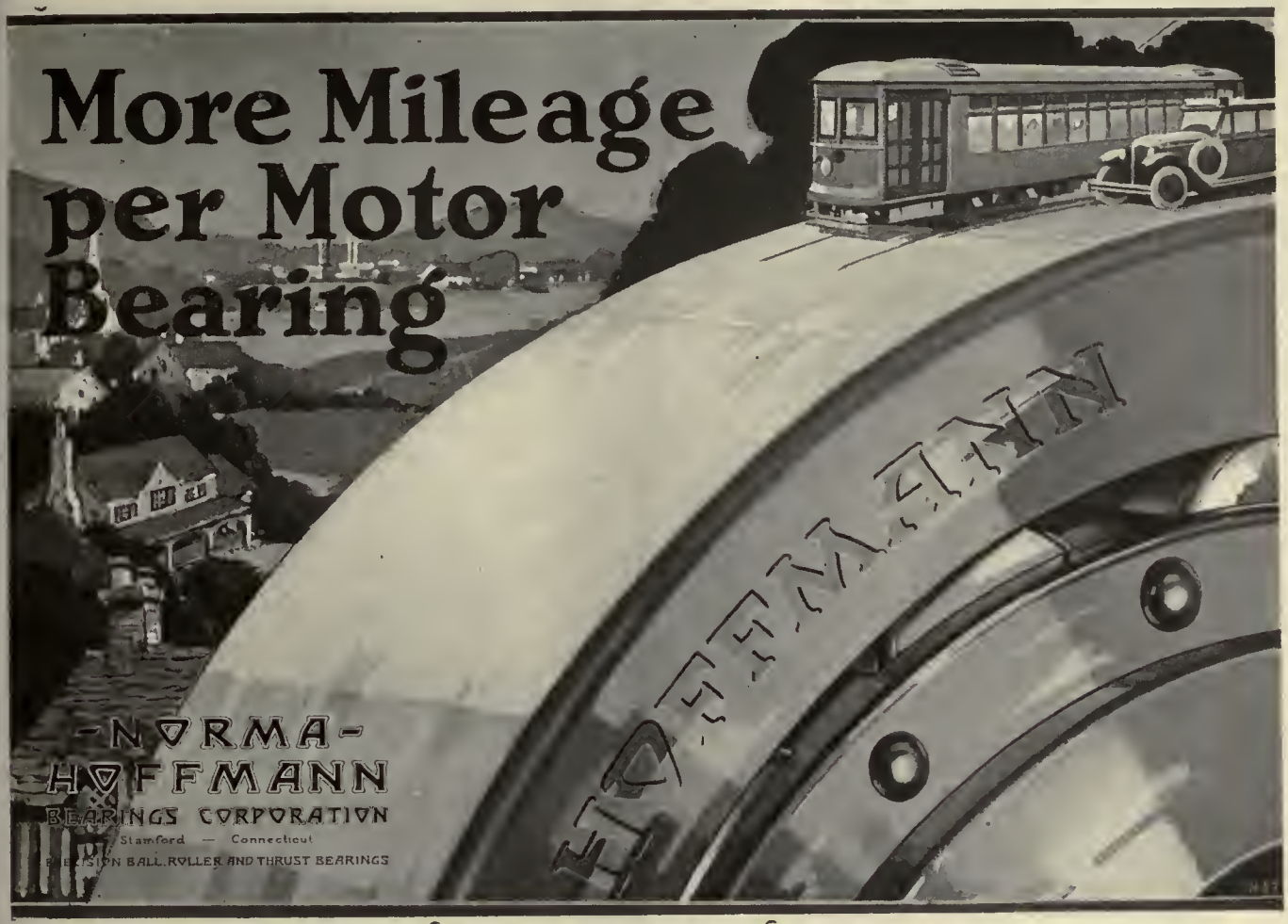
Cars may proceed from turnouts on clear signal indications, without needless waits. Cars may follow through the block without delay.

*Write for details.*

NACHOD & UNITED STATES SIGNAL CO.
Louisville, Ky.
Headway Recorders, Highway Crossing Signals

Nachod C D Signal on line of the Milwaukee Electric Railway & Light Co.






Griffin Wheel Company
410 North Michigan Ave.
Chicago, Ill.

# Griffin Wheels

with
Chilled Rims
and
Chilled Back of Flanges
For Street and Interurban Railways

FOUNDRIES:

| | | |
|---|---|---|
| Chicago | Boston | St. Paul |
| Detroit | Kansas City | Los Angeles |
| Denver | Council Bluffs | Tacoma |
| Cleveland | Salt Lake City | Cincinnati |

# ELECTRICAL INSULATION

PERFECT MICANITE INSULATOR and PERFECT EMPIRE INSULATOR

Micanite and Super-Micanite Sheets, Commutator Segments, and Commutator Rings

Micanite Tubes and Washers

Linotape, Seamless or Sewn Bias
*(Yellow or Black Varnished Tapes)*

Empire Oiled Cloths and Papers
*(Yellow or Black)*

Mico Compounds, Varnishes Etc.

*Send for catalog and helpful booklet on Commutator Insulation and Assembly*

MICA INSULATOR COMPANY
*Largest manufacturers in the world of mica insulation.*
*Established 1893.*

New York: 200 Varick St. Chicago: 542 So. Dearborn St.
Cleveland Pittsburgh Cincinnati
San Francisco Toronto Los Angeles Montreal
*Works: Schenectady, New York.* *London, England*

# Bankers and Engineers


**Ford, Bacon & Davis**
Incorporated
**Engineers**
39 Broadway, New York
PHILADELPHIA CHICAGO SAN FRANCISCO

**The J. G. White Engineering Corporation**
Engineers — Constructors
Steam and Hydro-Electric Power Plants, Gas Plants, Steam and Electric Railroads, Transmission Systems, Buildings and Industrial Plants.
43 Exchange Place New York

**STONE & WEBSTER**
Incorporated
Design and Construction
Examinations Reports Appraisals
Industrial and Public Service Properties
NEW YORK BOSTON CHICAGO

**THE BEELER ORGANIZATION**
Transportation, Traffic, Operating Surveys
Better Service—Financial Reports
Appraisals—Management
52 Vanderbilt Ave. New York

**SANDERSON & PORTER**
ENGINEERS
PUBLIC UTILITIES & INDUSTRIALS
Design Construction Management
Examinations Reports Valuations
CHICAGO NEW YORK SAN FRANCISCO

**ENGELHARDT W. HOLST**
*Consulting Engineers*
Appraisals Reports Rates Service Investigation
Studies on Financial and Physical Rehabilitation
Reorganization Operation Management
683 Atlantic Ave., BOSTON, MASS.

**ALBERT S. RICHEY**
ELECTRIC RAILWAY ENGINEER
WORCESTER, MASSACHUSETTS
REPORTS - APPRAISALS - RATES - OPERATION - SERVICE

**WALTER JACKSON**
*Consultant on* Fares and Motor Buses
The Weekly and Sunday Pass—Differential Fares—Ride Selling
Holbrook Hall 5-W-3
160 Gramatan Ave., Mt. Vernon, N. Y.

**A. L. DRUM & COMPANY**
*Consulting and Constructing Engineers*
VALUATION AND FINANCIAL REPORTS
RATE STUDIES FOR PRESENTATION TO PUBLIC SERVICE COMMISSIONS
CONSTRUCTION AND MANAGEMENT OF ELECTRIC RAILWAYS
230 South Clark Street, Chicago, Ill.

**J. ROWLAND BIBBINS**
CONSULTING ENGINEER — TRANSPORTATION
Organized Transit Development and Traffic Controls.
Economic Operation, Routing, Schedule Analyses.
Valuations, Rate Cases and Ordinances
EXPERIENCE IN 25 CITIES
2301 Connecticut Avenue Washington, D. C.

**KELKER, DeLEUW & CO.**
CONSULTING ENGINEERS
REPORTS ON
Operating Problems Valuations Traffic Surveys
111 W. Washington Street, Chicago, Ill.

**SCARR TRANSPORTATION SERVICE, INC.**
*Railway and Highway Consulting Engineers*
An organization of experienced engineers, prepared to assist you in the installation of highway operations as a substitute for or a supplement to your rail operations.
225 BROADWAY, NEW YORK

C. B. BUCHANAN, President — W. H. PRICE, JR., See'y-Treas. — JOHN F. LAYNG, Vice-President
**BUCHANAN & LAYNG CORPORATION**
*Engineering and Management, Construction*
*Financial Reports, Traffic Surveys*
*and Equipment Maintenance*
BALTIMORE: 1904 Citizens National Bank Bldg. — Phone: Hanover: 2142 — NEW YORK: 49 Wall Street

**HEMPHILL & WELLS**
CONSULTING ENGINEERS
Gardner F. Wells Albert W. Hemphill
*APPRAISALS*
INVESTIGATIONS COVERING
Reorganization Management Operation Construction
50 East 42nd St., New York City

**E. H. FAILE & CO.**
*Designers of*
Garages— Service Buildings— Terminals
441 LEXINGTON AVE. NEW YORK

**McCLELLAN & JUNKERSFELD**
Incorporated
ENGINEERING AND CONSTRUCTION
Examinations—Reports—Valuations
Transportation Problems—Power Developments
68 TRINITY PLACE NEW YORK

## *Specialization—*
## A Master Gauge

When it comes to measuring transportation problems from every angle, the analytical reasoning of trained engineering service assures accuracy.

Engineering service, particularly when it is highly personalized, is a *master gauge.*

W H Sawyer
PRESIDENT

STEVENS & WOOD, Incorporated
*Engineers and Constructors*
20 Pine Street, New York
Chicago - Youngstown, Ohio

*A Personalized Service*

THE WORLD'S STANDARD
## "IRVINGTON"
Black Varnished Silk, and Varnished Cambric, Yellow Varnished Paper
Irv-O-Slot Insulation
Flexible Varnished Tubing
Insulating Varnishes and Compounds
Irvington Varnish & Insulator Co.
Irvington, N. J.
*Sales Representatives:*
Mitchell-Rand Mfg. Co., N. Y.
E. M. Wolcott, Rochester
I. W. Levine, Montreal
A. L. Gillies, Toronto
Prehler Brothers Inc., Chicago
White Supply Co., St. Louis
Clapp & LaMoree, Los Angeles
Martin Woodard, Seattle
Consumers' Rubber Co., Cleveland



## Johnson Electric Fare Boxes




and overhead registers make possible the instantaneous registering and counting of every fare. Revenues are increased 1½ to 5% and the efficiency of one-man operation is materially increased. Over 5000 already in use.

**Johnson Fare Box Co.**
*4619 Ravenswood Ave., Chicago, Ill.*

THE P. EDWARD WISH SERVICE
50 Church St. NEW YORK — *Street Railway Inspection* DETECTIVES — 131 State St. BOSTON

When writing the advertiser for information or prices, a mention of the Electric Railway Journal would be appreciated.



*Gets Every Fare*
PEREY TURNSTILES or PASSIMETERS
Use them to your Prepayment Areas and Street Cars
Perey Manufacturing Co., Inc.
101 Park Avenue, New York City

*The* DIFFERENTIAL CAR



*Standard on 60 Railways for*

Track Maintenance
Track Construction
Ash Disposal
Coal Hauling
Concrete Materials
Waste Handling
Excavated Materials
Hauling Cross Ties
Snow Disposal

*Use These Labor Savers*

Differential Crane Car
Clark Concrete Breaker
Differential 3-way Auto Truck Body
Differential Car Wheel Truck and Tractor

THE DIFFERENTIAL STEEL CAR CO., Findlay, O.

UNA
RAIL JOINTS
DYNAMOTORS
WELDING ROD
UNA Welding & Bonding Co.
Cleveland, Ohio.

NORTHERN BELL WESTERN
CEDAR POLES
BUTT TREATING ALL GRADES TIES
BELL LUMBER CO., *Minneapolis, Minn.*

GOLD CAR HEATING & LIGHTING CO.
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Better Quality Seats For Cars and Buses
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## *M-J Armature Babbitt*






No less than twenty-five different grades of Babbitt have been successfully perfected in the More-Jones line, designed for various services and at varying prices. "Armature" for electric railways is the recognized standard. *Let us quote you.*

**National Bearing Metals Corporation**

New York, N. Y
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**"MORE-JONES QUALITY PRODUCTS"**

## COLUMBIA

**Railway and Utility Supplies**

Castings—Grey Iron, Brass and Aluminum

Forgings
Special Machinery and Patterns

Machine and Sheet Metal Work

Armature and Field Coils.

*The* Columbia Machine Works *and M. I. Co.*
265 Chestnut St., corner Atlantic Ave.,
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"B" Clamp Reinforcing Corroded Swaged Joint.

**Restores Strength of Corroded Pole**

*Rugged*
*Business-like*
*Economical*

Also:

Reinforcing Clamps for corrosion at ground-line and for extending pole with section of same or smaller size pipe, Williams Pole Mounts for tubular iron and wood poles.

Span Wire Insulator Hangers for Signal Wires, etc.

*Send for literature with prices on M. I. F. Specialties for Tubular Iron Poles.*

**MALLEABLE IRON FITTINGS COMPANY**
Pole Hardware Dept.
BRANFORD CONNECTICUT
New York Sales Office: 30 Church Street
also through:
Line Material Co., South Milwaukee, Wis.
Canadian Line Materials, Ltd., Toronto, Canada

**"STANDARD" STEEL PRODUCTS**

**ISI**

**Steel Axles Steel Springs**
**Armature Shafts**
**Rolled Steel Wheels**

**STANDARD STEEL WORKS COMPANY**
PHILADELPHIA, PA.
BRANCH OFFICES
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# SEARCHLIGHT SECTION

## USED EQUIPMENT & NEW—BUSINESS OPPORTUNITIES

UNDISPLAYED—RATE PER WORD:

*Positions Wanted*, 4 cents a word, minimum 75 cents an insertion, payable in advance.

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R.J.

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Order your advertisement printed at least 4 times.

### POSITION VACANT

COMPETENT man wanted, familiar with up-to-date store keeping methods to take complete charge stores department large public utility South America. Must be thoroughly experienced, good organizer with sound knowledge material and equipment. Knowledge Portuguese or Spanish desirable, but not essential; give full details education, experience and references. P-145, Electric Railway Journal, Tenth Ave. at 36th St., New York.

### POSITIONS WANTED

ENGINEER—Twenty years' experience with large Eastern road as roadmaster, division superintendent M. of W. and division manager. Qualified by experience for engineer M. of W. or manage a property operating cars and buses. PW-143, Electric Railway Journal, Tenth Ave. at 36th St., New York.

EXPERT, power saving; has saved western property in seven years $110,000 net, with kilowatt-hour meters; desires to make a change. PW-146, Electrical Railway Journal, 883 Mission St., San Francisco, Calif.

## *Searchlight can help you—*

HUNDREDS of miscellaneous business problems pertaining to Electric Railway Operation can be quickly and easily solved through the use of the Searchlight Section of this publication.

When you want additional employees, want to buy or sell used or surplus Railway equipment, seek additional capital or have other miscellaneous business wants—advertise them in the Searchlight Section for quick, profitable results!

*Think* "SEARCHLIGHT" *first*

## WANTED

### WE WANT TO BUY

1—Used Car Body only *(no trucks or equipment required)* for freight hauling purposes. Must be in good condition. Either wood or steel construction. Doors in center of car—45' maximum length.

### WE HAVE TO SELL

3—Standard Gauge Cincinnati Interurban Cars, 50' long, fully equipped.

7—Burney Cars, fully equipped; following additional equipment to be had separately:

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56—No. 101-B Armatures complete, Circuit Breakers KI0 Controllers, G. E. No. 1000 Ry. Motors complete with Gears and Pinions, KI2 Controllers, G. E. Circuit Breakers.

Also large line of new repair parts for above equipment—never been used.

ALL EQUIPMENT IN EXCELLENT CONDITION AND CAN BE INSPECTED AT SHEBOYGAN OR OSHKOSH, WISCONSIN.

*Wire or write.*

THE WISCONSIN POWER & LIGHT COMPANY
900 Gay Bldg., Madison, Wis.

WANTED
**5 Second Hand Birney Cars**
in good operating condition. Trucks Brill 79-E, Westinghouse 508-A Motors, K-63 Br. Controllers, General Electric C. P. 25 Air Equipment.
SIOUX CITY SERVICE COMPANY,
524 Nebraska St., Sioux City, Iowa

## TO HELP YOU

RENT, LEASE, OR EXCHANGE EQUIPMENT

**"Searchlight" Advertising**

# WHAT AND WHERE TO BUY

**Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors Advertising in this Issue**

This index is published as a convenience to the reader. Every care is taken to make it accurate, but *Electric Railway Journal* assumes no responsibility for errors or omissions.

**Advertising, Street Car**
Collier Inc., Barron G.

**Air Brakes**
General Electric Co.
Westinghouse Air Brake Co.

**Anchors, Guy**
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

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Columbia Machine Wks.
Elec. Service Supplies Co.

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American Brown Boveri Electric Co.

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Ramapo Ajax Corp.

**Automatic Safety Switch Stands**
Ramapo Ajax Corp.

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Bethlehem Steel Co.
Brill Co., The J. G.
Cincinnati Car Co.
Illinois Steel Co.
Standard Steel Works Co.
Westinghouse E. & M. Co.

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Shuler Axle Co.

**Axles, Steel**
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**Babbit Metal**
National Bearing Metals Co.

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American Bridge Co.

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National Carbon Co.
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Hyatt Roller Bearing Co.

**Bearings, Ball**
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Cincinnati Car Co.
Columbia Machine Wks.
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**Bearings, Center and Roller Side**
Cincinnati Car Co.
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**Bearings, Roller**
Hyatt Roller Bearing Co.
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Consolidated Car Heating Co.

**Bells and Gongs**
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Railway Trackwork Co.

**Blowers (Hand Portable)**
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Brill Co., The J. G.

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**Bolts, Case Hardened**
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American Steel & Wire Co.
Elec. Service Supplies Co.

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Amer. Steel & Wire Co.
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Elec. Service Supplies Co.
Ohio Brass Co.
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Elect. Railway Improve. Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Page Steel & Wire Co.
Railway Trackwork Co.
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Bates Expanded Steel Truss Co.
Columbia Machine Wks.
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Elec. Service Supplies Co.
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Ohio Brass Co.

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American Steel Foundries
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Cincinnati Car Co.
Nat'l Rlwy. Appliance Co.
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Bemis Car Truck Co.
Brill Co., The J. G.

**Brake Testers**
Nat'l. Rlwy. Appliance Co.

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Bemis Car Truck Co.
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Cincinnati Car Co.
Columbia Machine Wks.
General Electric Co.
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Cincinnati Car Co.

**Bridges, Steel**
American Bridge Co.

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General Electric Co.
National Carbon Co.
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**Brushes, Metal Graphite**
National Carbon Co.

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Columbia Machine Wks.
General Electric Co.

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American Bridge Co.

**Bunkers, Coal**
American Bridge Co.

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General Electric Co.

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American Steel Foundries
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Wks

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General Electric Co.
Irvington Varnish & Ins. Co.
Mica Insulator Co.

**Carbon Brushes (See Brushes, Carbon)**

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Consolidated Car Htg. Co.
Westinghouse E. & M. Co.

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Irving Iron Works

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Bethlehem Steel Co.

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National Carbon Co.

**Carbon Plates, Welding**
National Carbon Co.

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National Carbon Co.

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Brill Co., The J. G.
Differential Steel Car Co.

**Cars, Gas-Electric**
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General Electric Co.
Westinghouse Elec. & Mfg.

**Cars, Gas, Rail**
Brill Co., The J. G.

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American Car Co.
Brill Co., The J. G.
Cincinnati Car Co.
Kuhlman Car Co., G. C.
Wason Mfg. Co.

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Brill Co., The J. G.

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Cincinnati Car Co.
Columbia Machine Wks.
Nat'l. Bearing Metals Corp.

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American Bridge Co.
American Steel Foundries
Bemis Car Truck Co.
Columbia Machine Works & Standard Steel Works Co.
Wm. Wharton, Jr. & Co.

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Columbia Machine Wks.

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Cleveland Fare Box Co.
Electric Service Supplies Co

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Elec. Service Supplies Co.
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Westinghouse E. & M. Co.

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Brill Co., The J. G.
Cincinnati Car Co.

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**Coil Banding and Winding Machines**
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Elec. Service Supplies Co.
Westinghouse E. & M. Co.

**Coils, Armature and Field**
Columbia Machine Wks.
Elliott-Thompson Elect. Co.
General Electric Co.
Westinghouse E. & M. Co

**Coils, Choke and Kicking**
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General Electric Co.
Westinghouse E. & M. Co.

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Johnson Fare Box Co.

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International Register Co.
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Johnson Fare Box Co.

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Ideal Commutator Dresser.

**Commutator Equipment**
Ideal Commutator Dresser.

**Commutator Grinding Tools**
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**Commutator Mica Undercutter**
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General Electric Co.

**Commutator Slotters**
Columbia Machine Wks.
Elec. Service Supplies Co.
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**Commutator Slotting Files**
Ideal Commutator Dresser

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Columbia Machine Wks.
General Electric Co.
Westinghouse E. & M. Co.

**Compressors, Air**
General Electric Co.
Sullivan Machinery Co.
Westinghouse Tr. Brake Co.

**Compressors, Gas**
Sullivan Machinery Co.

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Sullivan Machinery Co.

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Ohio Brass Co.

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General Electric Co.
Westinghouse E. & M. Co.

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Elec. Service Supplies Co.

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General Electric Co.
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American Bridge Co.

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American Brass Co.
American Steel & Wire Co.
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Page Steel & Wire Co.

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American Steel & Wire Co.
Anaconda Copper Mining Co.

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Elec. Service Supplies Co.
International Register Co.
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Elec. Service Supplies Co.

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Nichols Lintern Co.

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Wm. Wharton, Jr. & Co., Inc.

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Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co., Inc.

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Ramapo Ajax Corp.

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Ohio Brass Co.
Westinghouse E. & M. Co.

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Railway Track Work Co.
Una Welding & Bonding Co.
Westinghouse E. & M. Co.

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Sioux City Service Co.
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Wish-Service, P. Edward

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Brill Co., The J. G.
Cincinnati Car Co.
Consolidated Car Heating Co.
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Cincinnati Car Co.
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Sullivan Machinery Co.

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Nat'l Railway Appliance Co.

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Electric Service Supplies
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Westinghouse E. & M. Co.

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Railway Trackwork Co.

**Electric Transmission Towers**
American Bridge Co.

**Electrical Wires and Cables**
American Steel & Wire Co.
Roebling's Sons Co., John

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Railway Trackwork Co.
Una Welding & Bonding Co.

**Electrodes, Steel**
Railway Trackwork Co.
Una Welding & Bonding Co.

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Holst, Engelhardt W.
Jackson, Walter
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Irving Iron Works

**Flooring, Non-Slipping**
Irving Iron Works

Continued on page 46



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Electric Railway
Automatic Signals
for Accessibility
and Reliability

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*"The Standard for Rubber Insulation"*

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Pettingall-Andrews Co., Boston, Mass.
F. D. Lawrence Electric Co., Cincinnati, O.
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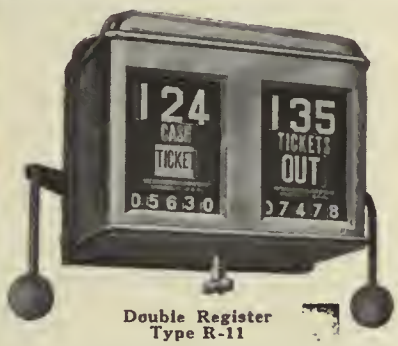
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Type R-11

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COIN COUNTING And Sorting Machines CHANGES CARRIERS Tokens

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Irving Iron Works

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Wm. Wharton,Jr.& Co., Inc.

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Westinghouse E. & M. Co.

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Columbia Machine Wks.
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North East Electric Co.
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**Girder Rails**
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Lorain Steel Co.

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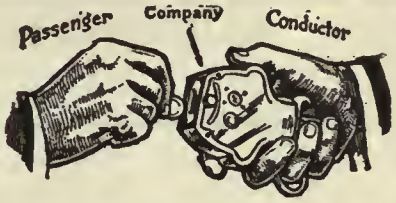
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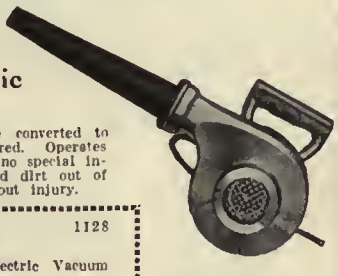
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Lorain Steel Co., The
Metal & Thermit Corp.
Railway Trackwork Co.
Una Welding & Bonding Co.

**Welders, Portable Electric**
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Ohio Brass Co.
Railway Trackwork Co.
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**Welders, Rail Joint**
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Ohio Brass Co.
Railway Trackwork Co.

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Metal & Thermit Corp.
Ohio Brass Co.
Railway Trackwork Co.
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**Wheel Guards (See Fenders and Wheel Guards)**

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**Wire Connectors (Solderless & Tapeless)**
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**Wire Splicing Plyers**
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**Wire Rope**
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Anaconda Copper Min. Co.
General Electric Co.
Okonite Co.
Okonite-Callender Cable Co
Page Steel & Wire Co.
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Westinghouse E & M. Co




# Create Community Pride

Successful railways are learning how to win confidence and create community pride. Probably the first step in attaining this goal is to examine existing rolling stock from the rider's point of view. Is the external appearance inviting? Do the comfort qualities equal those of the rider's automobile? Further, is the desire for speed satisfied?

The Fairmont Car, we believe, is an example of Brill engineering and workmanship that fulfills these conditions remarkably well. From a standpoint of appearance and comfort, this car leaves nothing to be desired. The reduced weight of the car together with the W-N drive which permits the use of light-weight, high-speed motors are aids to more rapid acceleration.

**Modernization with this type of equipment wins the confidence and support of financial interests. It does more. It creates community pride which is so essential to increased patronage.**

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.

AMERICAN CAR CO. ST. LOUIS MO. — G.C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

Pacific Coast Representative: Rialto Bldg., San Francisco



a-854-LC

*Waukesha equipped Linn Snow Tractors conquer the Arctic Winter*

# Waukeshas replace Huskies

**That Pullmans may go to Hudson Bay in 1929—tractor snow trains now push beyond the arctic circle. Arthur H. Chute in a recent Saturday Evening Post story vividly describes the thrill of seeing these Waukesha powered trains starting out on their trek across Hudson Bay and through trackless wilderness where temperatures of 50 below zero are often encountered. He said,**

*"A thrilling event during my stay at Nelson (on Hudson Bay) was the departure of four tractors, each loaded with four sleighs, carrying altogether some 200 tons bound for Churchill, 160 miles distant. Without a tote road, these 125 H. P. tractors have proved a revelation in winter transport in the north. Heretofore only dog teams had ever attempted this journey." This is always the impression Waukesha engines give users or observers who are not familiar with their wonderful power and unfailing reliability.*

*"L-Head Engines—They take better care of themselves."*

A-872-LC

AUTOMOTIVE EQUIPMENT DIVISION

**WAUKESHA MOTOR COMPANY**

**Waukesha** Wisconsin

*Eastern Sales Offices* — *Eight W. 40th Street* — *New York City*

*Exclusive Builders of Heavy Duty Automotive Type Engines for Over Twenty Years*

# ELECTRIC RAILWAY JOURNAL

Hill Publishing Company, Inc. NOVEMBER 24, 1928 Twenty Cents Per Copy



## SUMMING UP SAVINGS IN BUS PARTS

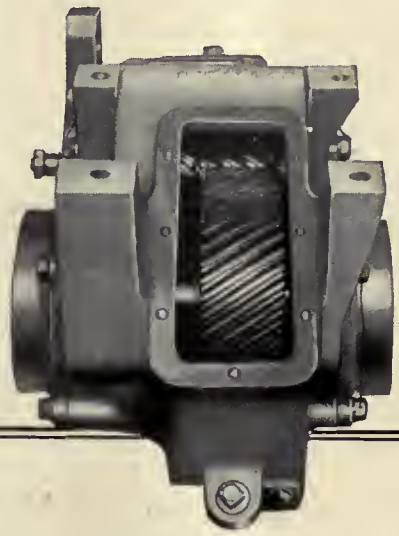
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TIMKEN *Tapered Roller* BEARINGS

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

# The W-N Drive and what it means to the Industry



1. Permits high ratio of speed reduction.
2. Permits use of high-speed, light-weight, low-voltage motors.
3. Spring suspension of motor.
4. Increased clearance under motor.
5. Gears rotate in oil bath which is more efficient than grease.
6. Faster acceleration and smoother starting.
7. Low operating and maintenance costs.
8. Quiet operation.
9. Less weight for total installation per horsepower developed than single-reduction equipment.
10. Increased gear life.

All Westinghouse-Nuttall Products are sold through the Westinghouse Electric & Manufacturing Company. Refer your inquiries to the nearest Westinghouse Office.

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# Electric Railway Journal

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1928

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*Vol. 72, No. 21* *Pages 905-944*

November 24, 1928

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*Decision in New York Fare Case Again Postponed—Four Years of Unification at Akron—Co-ordination Gaining Favor Abroad—Charter Bus Service a Means of Learning Passengers' Desires—Faster and Faster—Counsel from Caledonia—Making the Best Use of Available Information—Taxi Regulation Needed in Public Interest*

**Buffalo Railway Invests Heavily in Street Improvements** ..... 908

The track reconstruction and repairing program being carried out this year by the International Railway involves a total expenditure of $775,000, an amount that represents 7 cents of every dollar in fares.

**Horse-and-Buggy Speed Will Not Do Today** ..... 911

Though the street car is essentially a slow-moving vehicle it need not remain in the category of delay producers, for there are countless ways of improving its speed, as indicated in this comprehensive article.

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This three-page picture story indicates that European operators appreciate the merchandising value of attractive stop signs, maps, station lists, destination signs, information booklets and other passenger aids.

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Rearranging the storage yard tracks, remodeling the inspection bays and adding a new depot with ample office space and a recreation room for the trainmen has increased the car-handling capacity of the terminal.

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*Ten Cents Sought in Kansas City—New Company Takes Over Freight Business in Ohio—Supreme Court Directs New York Fare Case Be Reargued—A.E.R.A. to Go to Atlantic City in 1929—Fare Request Renewed in St. Paul—Detroit Prepares for New Bus Service*



Westinghouse Automatic Switching Equipment Installed in a Railway Substation.



Type CO Overload Relay



Annunciator Lockout Relay. Indicates Exactly Where Fault is to be Found.

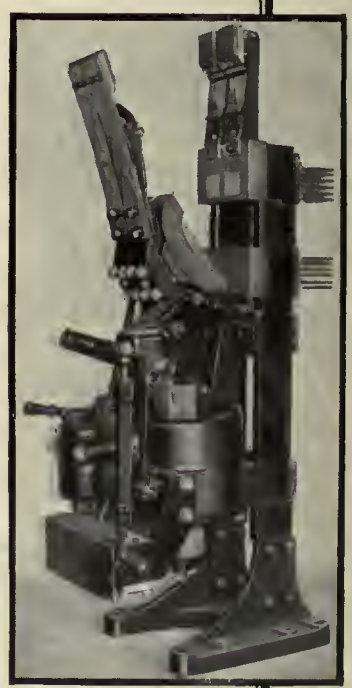
# *Details are important - - Westinghouse perfected them*

IN the construction of automatic switching equipment, it is of prime importance to devote much attention to the perfection of details pertaining to circuit-breakers, relays, instruments, etc. Herein lies the success of Westinghouse automatic switching equipment for railway substations.

In various instances, Westinghouse automatic equipments have been known to operate for months without a single interruption, thus proving how nearly perfection has been obtained through close attention to the finer details in automatic switchboard design and construction.

Circular 1793 tells in detail these finer features of Westinghouse automatic switching equipment for railway substations.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in all Principal Cities of the United States and Foreign Countries



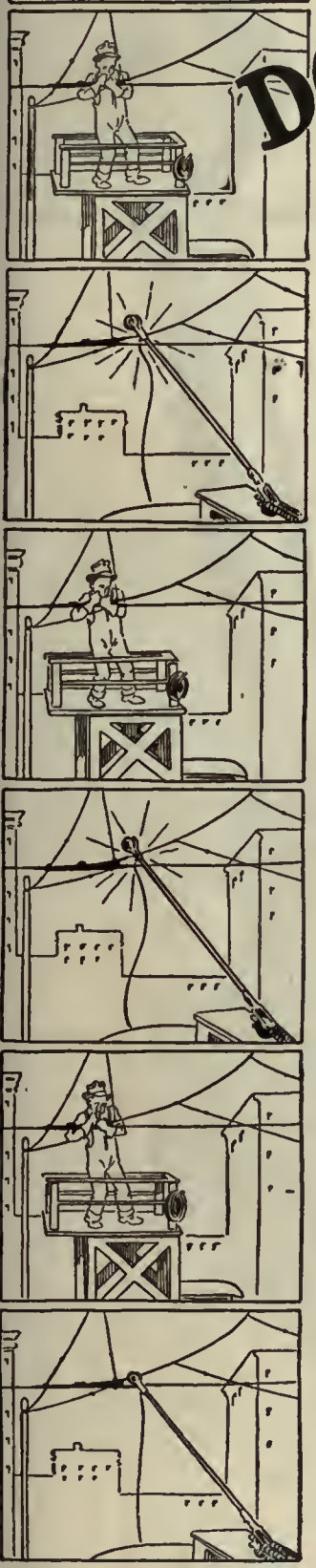
Type CH, Heavy-Duty Circuit-Breaker

*Automatize with* **Westinghouse**

1928

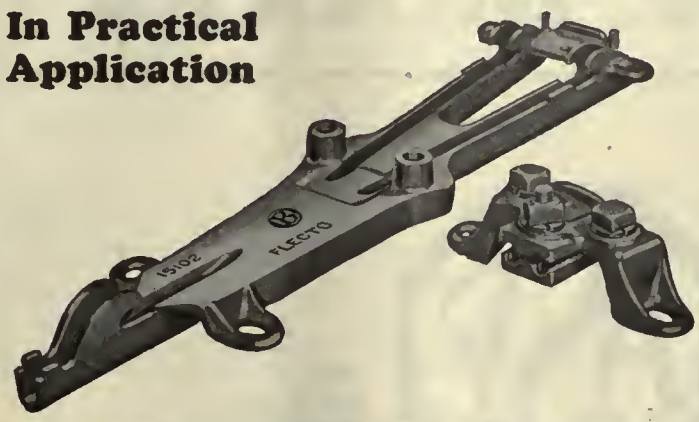
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Replacing an Ordinary Frog

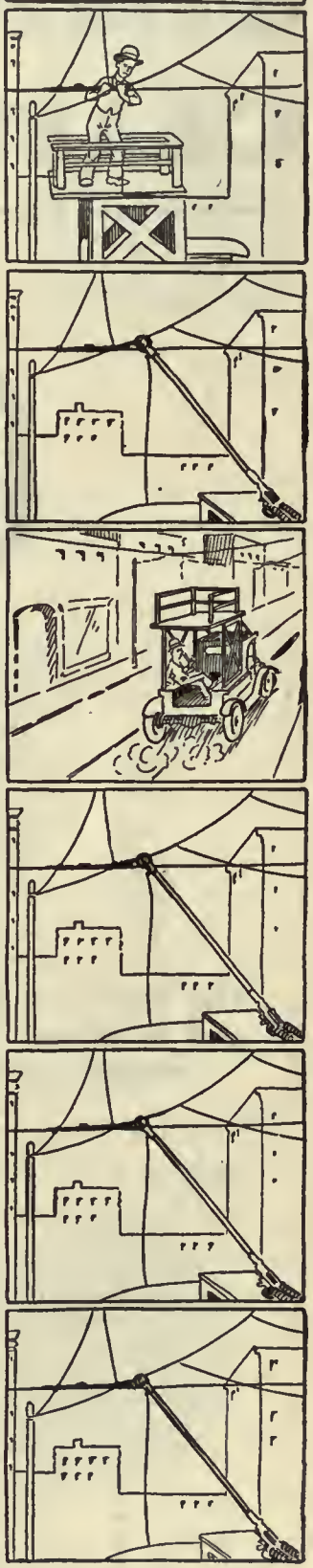


# DOLLARS AND SENSE

## In Practical Application




Replacing an O-B Duplex Frog



## Are You Still Paying the "Re-Spotting Super-Charge?"

OBSERVE the cost contrast in the illustrations on either side of this page. Your tower car foreman can tell you, your cost figures will show you, how much it is costing you to continue to "re-spot" your ordinary frogs every time a renewal is necessary.

Compare these costs with those you will *not* have, when you adopt—

## The New O-B Duplex Frog

The time-taking, skillful spotting job—necessary, if trolley wheels are to "ride" the frog without dewirement—is done once and for all time. The yoke remains fixed at the correct spot; all subsequent renewals of pan and cam tips are made quickly and easily. The same high degree of skill as is required to "spot" the frog originally is quite unnecessary.

Three years of everyday operation on many of the country's hardest frog locations have proved the service practicality of the Duplex Frog. Progressive, wide-awake overhead superintendents, the country over, have been quick to see the time and money saving features of this new O-B Duplex Frog. They have been placing sizable trial orders and coming back for more. Let us send you a copy of Folder 166L now. Ask your O-B salesman to show you a sample of the Duplex Frog.

**Ohio Brass Company, Mansfield, Ohio**
Canadian Ohio Brass Co., Limited
Niagara Falls, Canada
993L

# Ohio Brass Co.

NEW YORK CHICAGO PHILADELPHIA PITTSBURGH ATLANTA CLEVELAND SAN FRANCISCO LOS ANGELES

PORCELAIN INSULATORS
LINE MATERIALS
RAIL BONDS
CAR EQUIPMENT
MINING MATERIALS
VALVES

# SIMPLEX CLASP BRAKES




**The Standard Brake for 4 and 6 Wheel Truck Passenger Equipment**

Simplex Beam assembly furnished with brake hangers and beam trunnions protected against wear by hardened, ground bushings.

Positive acting, adjustable and reversible Brake head.

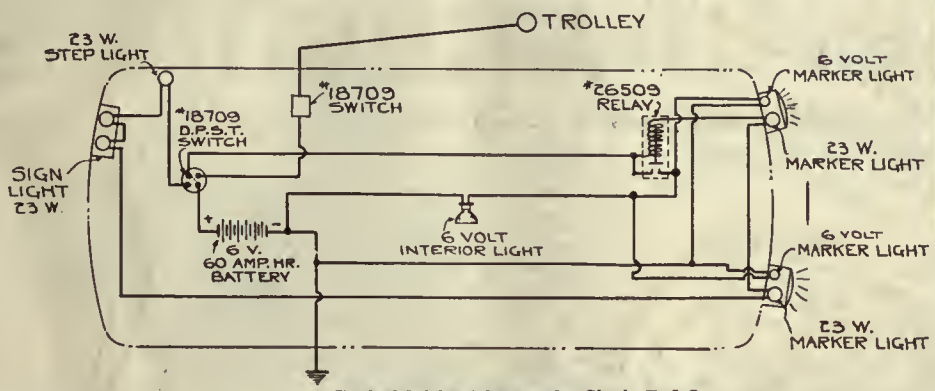
**AMERICA EEL FOUNDRIES**

NEW YORK CHICAGO ST. LOUIS

# *ESSCO emergency lighting system is accident and panic insurance*



Inside View of Type O Relay. Also made with socket for pilot light.




Typical Wiring Diagram for Single End Car
See page 157 of Catalog No. 7 for full information



Front View Type O Relay

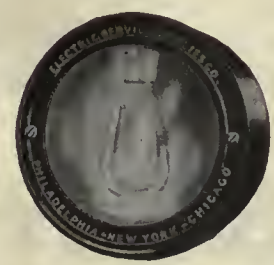
Here's what ESSCO emergency light relays do: provide an automatic means of cutting in an independent circuit of lamps, operated by a storage battery, in case of failure of the normal power supply in subways or during fogs, night operation, etc.—in short in any case where safety depends on lights when the normal power supply fails.

The relays are placed in series with five lamps on the usual 500-600 volt D.C. circuit. Current consumed is negligible and there is no appreciable voltage drop. Under normal conditions, the relay is energized and the independent storage battery circuit kept open, but upon failure of the normal current, the armature drops and closes the battery circuit, thus lighting up the emergency lamps.

ESSCO emergency lighting system is absolutely *dependable*. Get the details on this safety insurance today!



Rear View Type PR Rear Light



Front View Type PR Rear Light



Type V Rear or Marker Light

Home office and plant at 17th & Cambria Sts., PHILADELPHIA; District office at 111 N. Canal St., CHICAGO; 50 Church St., NEW YORK; Bessemer Bldg., Pittsburgh; 88 Broad St., Boston; General Motors Bldg., Detroit; 316 N. Washington Ave., Scranton; Canadian Agents, Lyman Tube & Supply Company, Ltd., Montreal, Toronto, Vancouver.

# ELECTRIC SERVICE SUPPLIES CO.

MANUFACTURER OF RAILWAY, POWER AND INDUSTRIAL ELECTRICAL MATERIAL

# 100 Per Cent One-Man Operation

## All cars of International Railway in Buffalo, Niagara Falls and Lockport run with one man. Accidents greatly reduced in number

IN THREE cities of the International Railway system on the Niagara frontier—Buffalo, Niagara Falls and Lockport—all local street car service is now rendered by one-man cars. Mitten Management began the program of conversion to one-man operation in Buffalo in 1923 and extended its replacement of two-man operation line by line as rapidly as it was able to provide its cars with full safety equipment. During this gradual change in the method of operation there has been a continuous reduction in accidents. In the year 1926 and 33 per cent 1927 there were 15 per cent fewer accidents than in 1923, when conversion to one-man operation began. Excluding collisions, which should not occur in one-man operation, the enormous increase in the number of these accidents is due largely to the increased number of vehicles now using the streets, I.R.C. officials point out. Below those of Chicago, where the accident ratio is 10 per cent greater, the company follows with transit police in charge of terminals. During the period, the company followed the policy of giving the public complete information regarding the changes in operation that were to be made, so that riders might know the advantages of the new system. Before their stations were converted there was some public opposition to the change, but this soon disappeared. As operators and passengers became more familiar with the new method of fare collection, however, this public suspicion and criticism, which was at first expressed or implied, is now extremely rare.

With the thought in mind that it is obviously unwise to have cars standing at loading points with other traffic while the doors are open, the company started on each one-man line the pay-in-the-country method of fare collection. Thus fare collection is eliminated from the heavy loading points and on the outbound trip the entire car becomes a loading platform with obvious advantages in inclement weather or under peak load conditions.

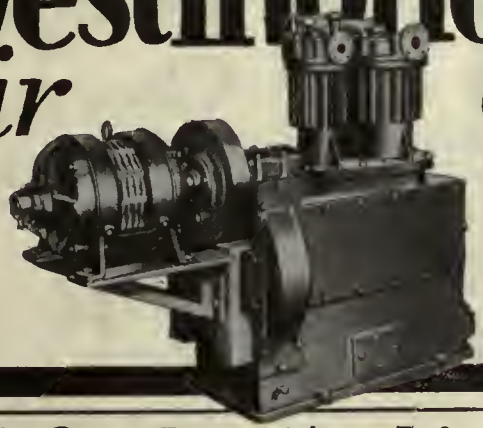
Dash signs were used to indicate the method of fare collection, while "read as you ride" folders and newspaper publicity were employed to describe the improvements in equipment and service, which included increased seating capacity and shorter headway, as well as greater safety.

Changes in the equipment included a complete overhaul from track to trolley wire of 251 cars, which were actually rebuilt in the company's shops, and installation of 100 per cent safety apparatus in all city cars. Three types of cars comprised the majority of equipment, the so-called 6000 type, a near-side car of the front entrance, front exit type on which the pay-as-you-enter system of fare collection had been employed, the double-end car with the pay-as-you-enter system, adapted to rear entrance, front exit, and the Peter Witt type on which the pay-as-you-pass system had been in vogue, passengers entering by the front of cars and leaving by the center. All types of cars were adapted to pay-as-you-pass-the-front exit method of fare collection. In some cases the change was literally made over night, the last car to operate under the old system being followed by the first car to operate under the new system, so that no operator or conductor could have any overlap in his duties during the



SAFETY CAR DEVICES CO.
OF ST. LOUIS, MO.
Postal and Telegraphic Address:
WILMERDING, PA.
CHICAGO SAN FRANCISCO NEW YORK WASHINGTON PITTSBURGH
8129

# Westinghouse National Air Compressors



## "A Quality Machine for Quality Service"

### and for every Type of Service

Realizing that the air brake was no more than a beginning in the use of compressed air by railroads, Westinghouse engineers have anticipated its further application and have bent their energy towards perfection of compressors to be used for every purpose in the railway shop, car barn, and power house.

As a result of this foresightedness, the Westinghouse-National line of compressors is most complete and includes every type of steam, belt, and motor driven mechanism that could possibly be used in railway work.

In size, these various compressors range from 3 to 700 cubic feet displacement and you will be interested in the compactness, automatic method of control, reliability, simplicity, and other features of construction which you will find embodied in them all.

Details of an air compressor installation suited to your needs may be obtained from any of our many conveniently located field offices. Describe the work you wish to do and we, in turn, will describe the type of machine you will find best adapted to this work.

WESTINGHOUSE TRACTION BRAKE CO.
*General Offices and Works: Wilmerding, Pa.*

# Don't depend upon the operator's memory- use Globe designed

## Area Fare Checks
## Identification Checks
## Zone Checks
## Cash Fare Receipts
## Hat Checks




With more than two zones it is impossible for the operator to check accurately against zone passengers. The two big advantages of these zone fare forms are:

1. They relieve the operator of all guesswork and prevent arguments.
2. They provide an accurate auditing check of all passengers carried and fares collected.

Globe experience is of value in designing the simplest, most economical system for use under any given set of conditions.

*Ask for samples.*

# Globe

TICKET COMPANY

*Factories:* Philadelphia *Sales Offices:*

Philadelphia
Boston
New York
Los Angeles
Atlanta

Baltimore
Cincinnati
Cleveland
Pittsburgh
Albany




# Mitten Management
## *standardizes on*
# YELLOW COACHES

# Satisfactory





# Performance

## Resulted in Repeat Orders and Standardization

Mitten Management in Philadelphia knows from experience the value of standardization.

Four years ago this co-ordinated city transportation company—the largest in America—placed its first order for Yellow Gas-Electric Motor Coaches.

The following record of repeat orders, showing how the present fleet of 569 Yellow Coaches was built up, is convincing evidence of satisfactory operating results and explains why P.R.T. standardize on Yellow.

Mitten Management in Philadelphia today operates 80 deLuxe 27-passenger Coaches; 239 Single Deck 33-passenger Coaches; 250 Double Deck 67-passenger coaches—all Yellow Gas-Electrics.

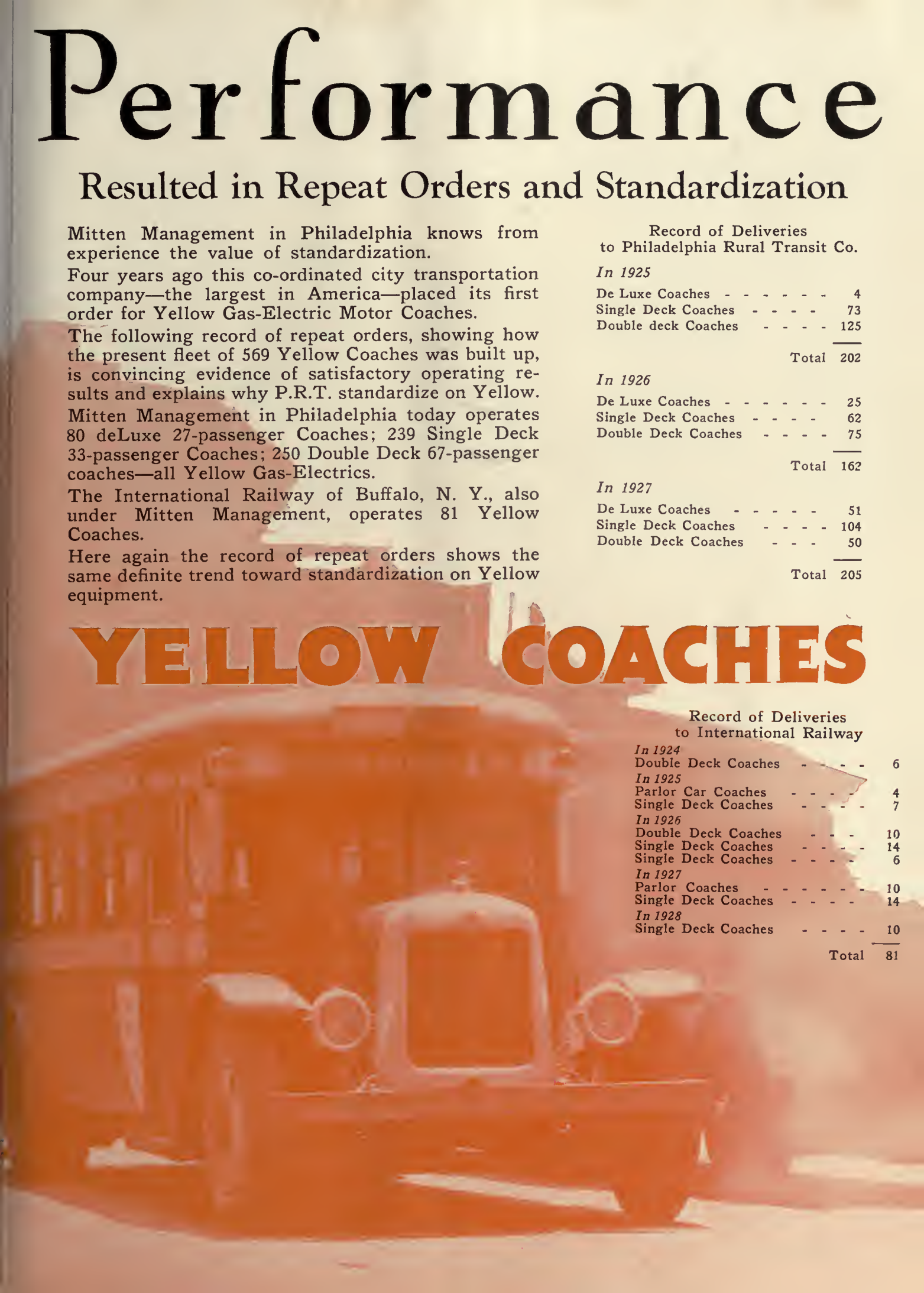
The International Railway of Buffalo, N. Y., also under Mitten Management, operates 81 Yellow Coaches.

Here again the record of repeat orders shows the same definite trend toward standardization on Yellow equipment.

Record of Deliveries
to Philadelphia Rural Transit Co.

| | |
|---|---|
| *In 1925* | |
| De Luxe Coaches | 4 |
| Single Deck Coaches | 73 |
| Double deck Coaches | 125 |
| Total | 202 |
| *In 1926* | |
| De Luxe Coaches | 25 |
| Single Deck Coaches | 62 |
| Double Deck Coaches | 75 |
| Total | 162 |
| *In 1927* | |
| De Luxe Coaches | 51 |
| Single Deck Coaches | 104 |
| Double Deck Coaches | 50 |
| Total | 205 |

# YELLOW COACHES



Record of Deliveries
to International Railway

| | |
|---|---|
| *In 1924* | |
| Double Deck Coaches | 6 |
| *In 1925* | |
| Parlor Car Coaches | 4 |
| Single Deck Coaches | 7 |
| *In 1926* | |
| Double Deck Coaches | 10 |
| Single Deck Coaches | 14 |
| Single Deck Coaches | 6 |
| *In 1927* | |
| Parlor Coaches | 10 |
| Single Deck Coaches | 14 |
| *In 1928* | |
| Single Deck Coaches | 10 |
| Total | 81 |



# Fifteen Million Miles Per Year
# Over Forty Six Million Passengers

That's what P.R.T. piled up in 1927 on 500 miles of Inter-City de Luxe Routes and 200 miles of City Service Lines. And during the summer season Yellow Coaches also carried passengers on tours to far distant points—Montreal, Buffalo and other spots of scenic and historic interest.

Passenger haulage includes those carried on three different types of operation: Inter-City, City and Suburban.

Every bus mile under Mitten Management in Philadelphia is a Yellow Coach mile.

Every bus passenger carried rides a Yellow.

Consistent re-orders are the best indication of satisfactory operating results.

GENERAL MOTORS TRUCK COMPANY
PONTIAC, MICHIGAN

## YELLOW COACHES

# TREADLE-IZATION




## *Always Safe*

Even though passengers stand on the treadle, the door *cannot open* until the car is at a full stop.

NATIONAL PNEUMATIC COMPANY

*Executive Office:* Graybar Building, New York

*General Works:* Rahway, New Jersey

CHICAGO
518 McCormick Building

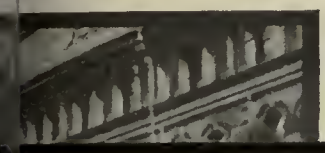
MANUFACTURED IN TORONTO, CANADA BY
Railway & Power Engineering Corp., Ltd.

PHILADELPHIA
1010 Colonial Trust Building



# IT'S FIVE





# O'CLOCK



OFFICES are closing, streets are filling with people, automobiles jam the highways, horns are barking—it's five o'clock and people are going home!

Will they ride in your cars?

Will those who do, have to endure a hot, jerky, stuffy uncomfortable car? Will they dread the long ride home?—Or will they ride in comfort—read their papers with ease—and be home "before they know it"?

Cincinnati Cars make people glad to ride. They create an appeal to ride again, and leave the pleasant taste of a service well rendered.

Cincinnati Cars have speed for fast runs, quick acceleration, extreme safety, large capacity—yet light weight and are unusually attractive. And the Cincinnati Duplex Air Magnetic Brakes make accidents and law suits a thing of the past.

Cincinnati Cars on your lines today assure you of larger patronage tomorrow.

CINCINNATI CAR COMPANY
CINCINNATI, OHIO

**CINCINNATI BALANCED LIGHTWEIGHT CARS**



**AMCRECO PRODUCTS** *eliminate doubts*

WHEN you specify Amcreco on poles, ties, or bridge timber, you get satisfaction without an "if."

This company has been growing through all the years since timber treatment became a commercial fact in this country. But in addition to being the largest organization of its kind today, it enjoys a leadership based on more than size.

The care used in securing and safeguarding creosote oil, the experience and high standing of its engineers, the character of the standard processes used in its 17 plants—these are some of the things which distinguish this company.

Engineers and purchasing agents know that such factors are vital in securing the kind of service which leaves no doubt. We welcome full investigation of our long record.

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LOUISVILLE ~ KENTUCKY

ERJ 11-24-Gray


No. 8M5 Special


No. 327-M Special

No. 327-M Special seats are in use by the Virginia Electric and Power Company, which was awarded the Charles A. Coffin medal for 1928.

# DESIGNED FOR INTERURBAN USE

THE 327-M Special is a popular Heywood-Wakefield electric railway seat. The deep, double spring construction of the cushion and the restful pitch of the spring-filled backs make this attractive style one of the most comfortable interurban seats ever offered.

The 8M5 Special is a de luxe interurban type with spring-filled seats and backs. It has been purposely designed and built to withstand the most severe use and abuse, while delivering trouble-proof service year after year.

Our car seating experts will be glad to assist in solving your equipment problems. This service is yours without cost or obligation. Just write to the nearest Heywood-Wakefield sales office.

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133 Eastern Ave., Toronto; Montreal; Winnipeg, Canada



*One of the 96 buses of the Teche Transfer Company, Inc., Franklin, La., equipped exclusively with Goodyear Pneumatic Cord Bus Tires*

GOODYEAR

Copyright 1928, by The Goodyear Tire & Rubber Co., Inc.

# "On our entire fleet for the last nine years"

Teche Transfer Company, Inc., of Franklin, La., began operations nine years ago with a few touring cars running between Jeanerette, Franklin and New Iberia, a distance of about 50 miles.

Today, they operate 96 modern, luxurious motor coaches, averaging 10,000 miles a day and carrying about 100,000 passengers a month over routes totaling 1,000 miles, east from New Orleans to the Mississippi Gulf Coast, north through Baton Rouge to Natchez, and west to Lake Charles, through the historical land of Evangeline.

And their tire equipment today as throughout their history is *exclusively* Goodyear Cord Bus Tires.

♦ ♦ ♦

"During the nine years we have been operating," writes Mr. F. J. Feight, President, "we have tested out all makes of tires but found Goodyears gave us the best service of all—and for this reason we have used them exclusively on our entire fleet for the last nine years.

"Our relations with the local Goodyear Branch have always been very pleasant and the service rendered by The Goodyear Tire & Rubber Co., Inc., has been entirely satisfactory in every way."

The kind of tire performance on which Mr. Feight bases his letter is exemplified in average monthly mileages ranging from 15,000 to 28,000 tire miles—dependably, economically, on Goodyear Cord Bus Tires.

♦ ♦ ♦

Goodyear Tires are an important factor in successful motorbus operation.

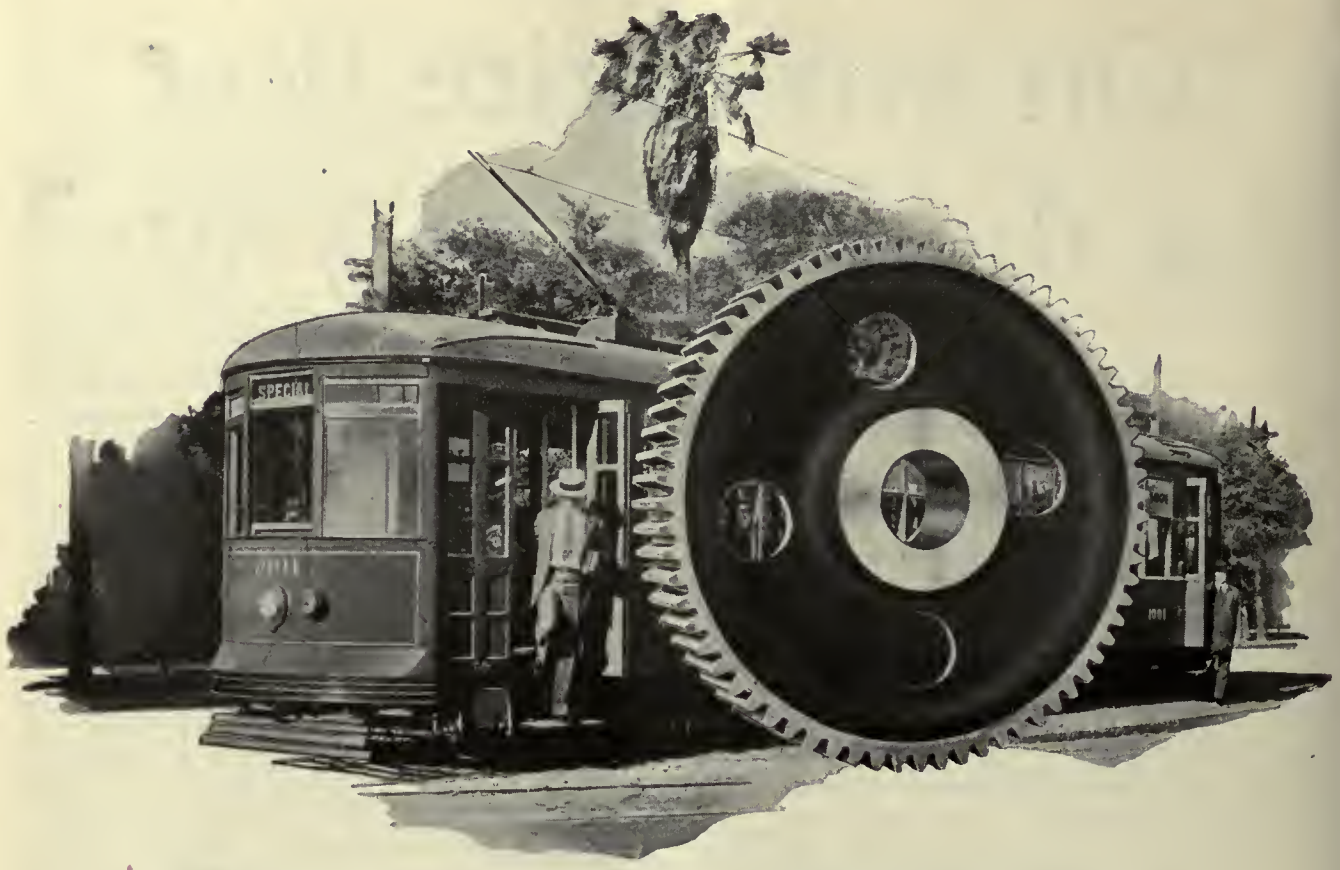
Their powerfully tractive All-Weather Tread is an insurance of safe, sure, gripping traction on all roads and in all weather.

Their extra-elastic, extra-durable bodies of SUPERTWIST Cord have the strength that means freedom from trouble on the road, the vitality that means low cost per tire mile.

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*For every Goodyear Cord Bus Tire there is an equally fine Goodyear Tube, built specially for bus service, and also Goodyear Rubber Tire Chains*

**BUS TIRES**




# Give the wheels the smooth motion of the motors

Smooth and uniform angular velocity of the motors is transmitted quietly and efficiently to car or locomotive wheels that are driven by G-E long-addendum pinions and short-addendum gears.

This gearing is designed with true involute curves without modification. When mounted on correct centers, it runs quietly with practically no wear on the bearing flanges. Both the pinion and gear possess unusual strength because of the increased thickness of metal at the base of the tooth. This improved product represents a distinct advance in gear design.

It will pay you to use this G-E quiet gearing—the gearing that is hard but not brittle—that need be replaced only when long service has worn it out.

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GENERAL ELECTRIC

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# Electric Railway Journal

*Consolidation of*
*Street Railway Journal and Electric Railway Review*

McGraw-Hill Publishing Company, Inc.
James H. McGraw, *Chairman of the Board*
Malcolm Muir, *President*
H. C. Parmelee, *Editorial Director*

CHARLES GORDON, *Editor*

Louis F. Stoll,
*Publishing Director*

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## Decision in New York Fare Case Again Postponed

ACTION this week by the United States Supreme Court in the New York City fare case has received various interpretations. Some advocates of the 5-cent fare profess to see in the order for a reargument an indication that the court inclines to their view. On the other hand, believers in a higher fare point out that the order shows only that the court is prepared to hear arguments. This means, they conclude, that the court considers the case within its jurisdiction.

The authority of the federal courts to intervene in such essentially local matters as franchises and rates of fare of intrastate railways comes from the 14th Amendment to the Constitution which forbids any state to deprive "any person of life, liberty or property without due process of law." Utility rates come under this clause because, as the property of a utility is devoted to public use, its rates may be regulated by the state. If they are regulated by the state, it is violating the federal constitution if it imposes a confiscatory rate or if it refuses to relieve a company from a confiscatory rate.

Not all utility franchises, of course, are awarded by the state—at least not wholly by the state. The city in which the utility is located often is a party to the franchise grant. Where this occurs, the city may have the power to act independently of the state in awarding the franchise, it may do so simply as an agent of the state, or it may act jointly with the state. If there is nothing in the state constitution or in its basic law to prevent it doing so, a state may authorize a city to be the sole grantor and empower it to award a franchise which in essence would be a contract. There are decisions which indicate that the Federal Supreme Court will not intervene in such a case to overturn the contract, no matter how improvident to one side or the other it may have been. But its decisions also indicate that not only must any such surrender be very clear and unmistakable but that it must also be definitely shown that the state had the power at the time to delegate such authority. This takes the question back again to the wording of the State Constitution, as well as to its basic laws.

From this it will be seen that a federal decision in one city on utility rates may not necessarily control in another, or even that two decisions in the same city may not be identical, if the franchises were awarded at different times.

It is the contention of the Interborough Rapid Transit Company, of course, that New York State never delegated to New York City so much of the state power over utility rates as to prevent the state from raising such rates if they became confiscatory but that they were subject to the public service commission law and hence subject to the state's regulatory power over rates. It is also the contention of the Interborough that its applications to the state commission for rate increases have been disregarded, so that its only recourse for relief had to be to the federal courts.

From its recent action it appears that the United States Supreme Court is willing to consider this case on its merits, but nothing thus far disclosed gives any real clue as to what its final decision will be.

## Four Years of Unification at Akron

FOUR years ago the city of Akron Ohio, was just beginning to recover from the effects of a controversy in which all railway service was withdrawn. The local company's franchise had expired and the city and the management were unable to reach a settlement over terms that involved a readjustment of fares. It was a story long drawn out, but fully reviewed in the JOURNAL at the time. Out of the controversy grew a settlement which provided for operation by the Northern Ohio Power & Light Company over a period during which strict account was to be kept of income and outgo so that the basis might be reached for the negotiation of a new contract. That period has now expired, but service will be continued under the terms of the temporary grant until negotiations can be concluded, based on the results of the study of the last four years.

Since the temporary grant was arranged in Akron the transit situation there has undergone changes probably greater than those of any other city, certainly any other city comparable with it in size. Car and bus lines now form a complete network in and about Akron, so that the company has become the largest bus operator in Ohio and one of the largest operators in the United States. In every way possible the company has developed bus transportation. It has done this not only in its own interest but in the interest of all Akron as well, since that is what Akron apparently desired. That which has been accomplished is the result of united effort. The people of Akron aided materially, first by gladly voting for a progressive franchise, and, second, by the application of a proper supporting spirit.

Traffic conditions in Akron are becoming worse as the years go by. Demands are certain to become heavier on the city's transportation system. A committee of citizens—men who desire to see advancement—undertook several months ago to investigate the company's transportation system thoroughly and to study the city's future needs and requirements. This report is said to be nearly ready. Officials of the company pledge their continued co-operation.

Out of Akron ought to come a tale of experience of benefit to the entire industry. Certainly if nothing is permitted to mar the spirit of friendly co-operation which has been so much in evidence the last four years, a new operating contract ought to result with terms based on a period of experience under new conditions and leaving very little chance for controversy in the future.

## Co-ordination Gaining Favor Abroad

WHEN the Board of Estimate in New York City was debating recently the relative merits of competitive vs. co-ordinated bus operation in connection with the Equitable proposals, there may have been those who thought the problem a purely local one. Actually the same question is alive in many other cities both here and abroad. For example, there is the situation in Havana, which was discussed in detail in the Oct. 27 issue of the JOURNAL. This seems to have a counterpart in Buenos Aires. According to a paper presented at the local branch of the Institute of Transport in that city on June 21, 1928, it appears that serious evils have followed unregulated competition in the Argentine capital, where for many years the subways and street cars had a monopoly of public carrier transport. Instead of advantage being taken of the possibilities of the bus for special service, independent buses have been allowed to confine their operation almost entirely to the more congested city districts, where patronage was greatest but where the existing facilities were adequate to care for the business offered. The result has been too much service in some parts of the city and not enough in others, unsatisfactory returns for all carriers, and a demand from traffic experts for the consolidation of all lines into one company.

In European cities the unified system is becoming more and more usual. Just this past week dispatches from Berlin told of final accomplishment of the long-pending consolidation of rapid transit, surface car and bus lines. Reports from London are to the effect that negotiations are progressing favorably for the operation of the municipal tramways by the present bus and rapid transit combine. In Paris the buses and surface cars have been under one management from the beginning. Thus it goes. On every hand co-ordination is being found to be the best policy.

## Charter Bus Service a Means of Learning Passengers' Desires

EXECUTIVES of electric railways who have encouraged the use of buses in charter service, even if they have gained nothing else from the venture, at least are in an excellent position to study the requirements of their regular patrons from a point of view otherwise denied to them. What the well-intentioned patron wants in the way of car service can be learned from the demands of a group of passengers seeking chartered bus service. The best viewpoints can be obtained when the company has several different types of buses which it is prepared to charter at various rates.

The agent in direct charge of charter service is in an excellent position to study passenger psychology and estimate its bearing on general passenger requirements. To him come people of a class who obviously are seeking something which, while not expected to possess the individuality of the private automobile, is superior to the regularly scheduled car or bus. What they seek may be termed de luxe mass transportation. If the chartered bus fulfills their requirements, it is interesting to determine which points of superiority commend it. If a choice is made among several types of equipment, the reasons for that choice are of great value. Is economy or comfort a deciding factor? Is the passenger willing to pay more for mere appearance, other things being equal? Is expense really much of an object if the passengers get what they want? Is speed the most important factor or is safety the first requisite? Is there a preference for any type of seat, any type of finish of interior, and so on? For instance, if there is a general preference for the bucket type of seat and for leather or plush upholstery, it is quite evident that the stiff-backed, rattan-upholstered seats or the wood slat seats such as are used in many street cars are not highly regarded by the patrons. If complaints are made after the trip that the passengers were cramped in their seats or that the buses are poorly sprung or are poorly ventilated, such information is of value and can be turned to good account the next time an order is placed for rolling stock. It may even lead to modifications of the present equipment.

While there will always be a difference in attractiveness and comfort between a mass transportation vehicle and a de luxe one, a study of passenger preference will make it possible to eliminate many features considered objectionable by the patrons and incorporate others considered desirable, when it can be done at a cost commensurate with the service the vehicle is to render. In obtaining such opinion there is no means more direct or more satisfactory than to heed the demands of the users of chartered service.

## Faster and Faster

SECONDS, not so long ago, were considered almost negligible units of time. Even minutes held no great interest for a comparatively slow-moving age. The people were not accustomed to rapid means of transportation and did not think of their trips to town or to work in terms of so many minutes and so many seconds. However, the "Good Old Days" are now past history and a new demand has been created—a demand for speed. How usual it is to hear someone say: "It takes me two minutes to reach the subway station, about a half minute to catch a train, from eighteen to nineteen minutes to reach Utopia Avenue and another nine minutes to reach the office by taking a crosstown trolley." Just as the public now measures its traveling time in minutes and fractions of minutes, so must the transportation man measure his service in smaller units of time.

Countless suggestions for increasing the speed of cars have been made. Many of these have been impracticable or have involved elaborate programs costing enormous sums. Perhaps the most helpful recent outline of ways and means of increasing speed is that prepared by the service betterment committee of the T. & T. Association. Although the suggestions are fundamental and not intended to be applicable to all properties, they cover almost every possible time saver and hold many practical suggestions for any company. Increasing the proportion of time during which cars move at maximum free running speed by reducing the number of passenger stops, locating the others scientifically and regulating traffic properly are ways of shortening running time. Another is to reduce the duration of stops by using the most efficient method of fare collection and designing the cars to aid passenger flow. Better equipped cars, a properly designed track layout, a reliable power system and sufficient emergency and wrecking facilities also are necessary elements. The final and probably most important suggestion of the group is to train car operators to use to the full every opportunity for saving time. A summary of these suggestions appears elsewhere in this issue.

Faster and faster is the urge of the present day. Electric railway managements notice it on all sides and

realize that unless speed can be obtained that is comparable with the speed of other modes of travel available today, difficulty will be experienced in retaining their present patrons. For this reason they will undoubtedly welcome the excellent report prepared by the committee on service betterment and will study it carefully with the aim of putting the ideas into practice on their own systems. Delays can be lessened and the over-all running time over routes reduced to the satisfaction of the passengers by taking advantage of the efforts of the executives who composed the report.

## Counsel from Caledonia

SCOTCHMEN are world-renowned for thrift. They do not spend a penny wastefully. They are sometimes thrifty to the extent of being parsimonious, if one can believe popular tales. Yet the City of Glasgow has just been installing upholstered seats on all of its street cars; moquette on the lower deck and genuine leather on the inclosed upper deck. The wooden seats just discarded were as good as wooden seats can be. They and their predecessors had answered all requirements in Glasgow since street cars had run in that city on the Clyde. But in this day and for this generation they sufficed no longer. The automobile in its various forms was responsible for the change. As in other cities, the traveling public had become used to the upholstered seats on private cars and buses. The tramway receipts began to fall off. It was to meet this competition that the Glasgow trams were modernized with more comfortable seats and in other ways at a cost of nearly $5,000 per car.

Utilities in American cities that have not yet realized the need for meeting modern conditions can well consider this example. Automobiles are less expensive to buy and operate here than in Scotland and consequently are much more common. The average American is a spendthrift in matters concerning his personal comfort. In this particular, he is the antithesis of the canny Scot. Will electric railway companies here keep any considerable portion of their patronage if they continue to operate antiquated, slow and uncomfortable cars? The answer is that they cannot, when other means of transportation are available to the traveling public. Many railway companies understand the need for better service, but too many obsolete cars are still being used.

## Making the Best Use of Available Information

COMMENDABLE indeed is the attitude of the committee appointed by the National Educational Association to investigate the use in schools of publicity material supplied by propaganda agencies and other organizations. The chairman of this committee, Dr. Edwin C. Broome, superintendent of Philadelphia schools, takes a moderate and unbiased position. He says that:

"There has been a growing tendency since the war, throughout the United States, to bring into the public schools of the country enterprises which, while they may be good in themselves, are not so sufficiently educational in value that they should be allowed to interfere with the plan and purpose of the public schools. Some of these enterprises are out and out advertising schemes. Others are propaganda, some good and some bad. Some are efforts to use the schools to raise money for various enterprises which may be good in themselves, but raise the question as to whether the public schools which the children are compelled to attend by law, should be fields for money raising or projects outside of the activities of the school."

The expressed purpose of the committee is to study constructively the question of how schools can bring themselves into closer touch with everyday life through the proper use of the vast amount of material which various organizations and agencies now have available for school use. The committee will endeavor to outline the principles which should guide school officials and teachers in using such material so that the children may be protected from onesided viewpoints and from exploitations for advertising purposes.

Certainly no reasonable person can take exception to this. Least of all will the electric railways raise any objection. The committee recognizes the desirability of bringing the schools into touch with everyday life—in which nowadays the public utilities play so important a part. That, indeed, is all that any one can ask.

## Taxi Regulation Needed in Public Interest

DEFINITE suggestion that regulation of taxi-cabs is needed was made at the recent meeting of the National Association of Railway and Utilities Commissioners at New Orleans by President J. P. Barnes of the American Electric Railway Association, as told in the report of the meeting printed elsewhere in this issue. That the JOURNAL is heartily in accord with this suggestion was indicated by an editorial published in the issue of Nov. 10.

Of course, the inference is quite natural that street railway men have a selfish interest in the regulation of the taxi business. But their interest is not entirely a selfish one. Taxis operated by responsible, organized companies are not serious competitors of street cars. They render an entirely distinct class of service at a different level of rates. It is when cut-throat competition by more or less irresponsible operators forces taxi rates below the cost of giving service that the taxi deteriorates into little more than a jitney and invades the field of the mass transportation vehicle. This form of competition, though experienced in a number of cities, has so far done little serious harm to the street railways. It threatens to prove far more serious to the taxi business itself than to the other carriers with which taxis may compete.

It seems reasonable, therefore, to point out that suggestions of the need for regulation of taxi-cabs, coming from the street railway industry, are not dictated entirely by selfish motives. Although it is beyond the scope of this discussion to go into the details, it could be demonstrated readily that regulation would be extremely desirable from the standpoint of existing operators and manufacturers of taxi-cabs. It would exert a stabilizing influence, the lack of which has produced a high mortality rate in the taxi business during recent years. But above all, regulation is needed from the standpoint of the public interest. Reliability and responsibility of management soon break down under the influence of unregulated competition. Duplication of facilities and service produces inefficiency and waste. Then again, the cruising taxi, intent on picking up the stray passenger before a competitor sees him, is a large element in the traffic congestion on present city streets. These and many more factors indicate that the question of regulation is indeed a matter of public and not private interest.

# Buffalo Railway Invests Heavily in Street Improvements

**I.R.C.'s reconstruction program is co-ordinated with the city's repaving program. New standards of track construction adopted for extensive program**



**Much of the reconstruction work in Buffalo is being done at night**

RECONSTRUCTION of tracks and paving in the city of Buffalo has progressed rapidly. The International Railway, under Mitten management, mapped out a program for the current year involving an expenditure of $375,000, an amount 50 per cent more than the sum spent last year and more than has been spent for the past five years. In addition $400,000 is being spent this year, as was spent last year, on track and paving maintenance, bringing the total cost of the street improvement program to a point where it absorbs 7 cents of every dollar collected in fares, a limit beyond which the company does not feel it can go under present rates.

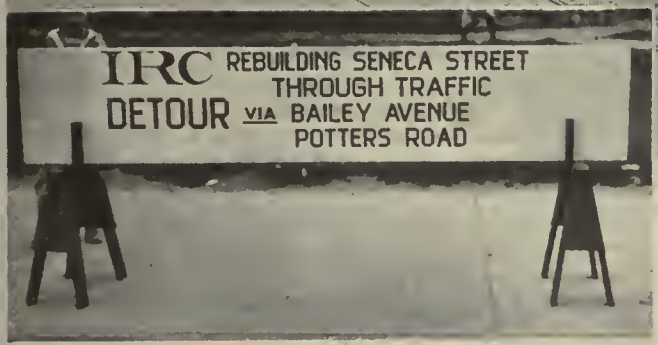
Several interesting features distinguish the International Railway program from the average job of this kind. In the first place, after the amount of money available has been determined, the streets on which it is to be expended are decided upon in a conference between city and company officials. The company does not arbitrarily make its own decisions regardless of the wishes of city officials or of civic associations. The importance of each street on which reconstruction is needed is considered carefully from the standpoint of general traffic as well as of street railway service. Thus, every interest is considered and the company's reconstruction program is co-ordinated with the city's street repaving program. This co-operative development of the track and paving reconstruction program has created much good will.

As soon as the streets to be repaired in 1928 were selected, the program was announced in the newspapers. Since the original announcement every effort has been made to keep the public informed regarding the progress of track and paving reconstruction and regarding the features that limit the company's ability to do such work. A part of this program of informing the public was the publishing in newspapers of weekly progress reports.

As each job was begun, a public relations representative of the company called on every resident and business man in the section, outlining the details of the company's arrangement for that particular job and assuring them that every effort would be made to minimize inconvenience. Much favorable comment followed this procedure.




On some of the narrow streets the space for storing material is very limited




Traffic is diverted to other streets wherever possible to avoid congestion on streets being repaired

Similar information was given to the business associations in the various communities effected, with the result that the closest of co-operation was developed between these organizations and the railway. So favorable an opinion was created with one business men's association in whose district reconstruction was under way, that a resolution was passed unanimously urging that street railways be relieved of the paving obligation inherited from horse car days.

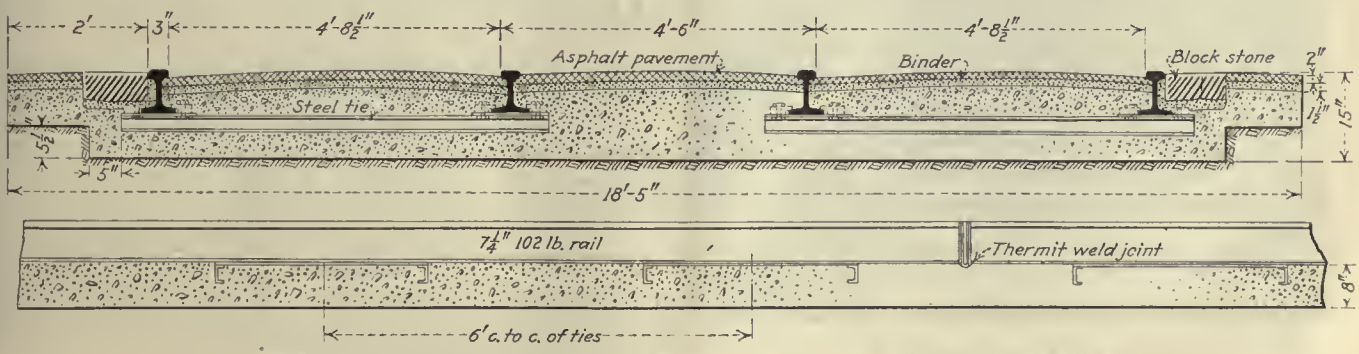
### Signs Inform Public of the Railway's Track Activities

Although the International Railway had been spending large sums for maintenance in years past, it was discovered that little was known about this phase of the company's work. To keep the public informed, the company began last year to post signs at each location where track repairs, however minor, were under way. These signs read "Drive carefully, I.R.C. repairing track and paving." They were placed in all sections of the city where large or small gangs of company workmen were carrying on track or paving repairing. Favorable public reaction followed almost immediately.

The same idea was applied to the reconstruction program, except that large buckboard signs were employed. These signs read "Drive carefully, I.R.C. rebuilding track and paving." In co-operation with the Automobile



Preparing special trackwork for installation. At important intersections special work is installed by night crews




Cross-section of the new type of track construction adopted by the International Railway

Club of Buffalo, detour signs were posted at dangerous points, greatly reducing the amount of traffic through the areas under construction.

Railways in New York State are required by law to pave the area between the track and 2 ft. on each side. The total width of pavement, therefore, including a 5-ft. devil strip for which the railway is responsible, is 18 ft. 11 in. In a 49-ft. street the cost of the railway track and paving work is approximately 47 per cent of the total street improvement. This information is conveyed to car riders and to the public generally through buckboard signs and through ceiling signs displayed in the company's cars.



**Bringing the track into line before pouring the concrete base**

Most of the existing trackwork in the city of Buffalo is of grooved girder rail construction with blockstone between the tracks and in the devil strip. However, an improved type of construction, involving many changes in the old specifications, has been adopted for the work now under way. Among these changes are the use of T-rails, steel ties, Thermit-welded joints and asphalt pavement between the rails in place of blockstone.

International steel ties are being used on all new track construction work. They are being placed 6 ft. apart. The company is laying its rail on a concrete base, the distance from the ballast base to the top of the asphalt paving being 15 in. The concrete layer is 11½ in. thick.



**Assembled track, aligned and ready for the concrete base**




**View of Seneca Street with the track reconstruction about completed. The sign calls attention to the fact that the I.R.C. is paying 47 per cent of the total cost**

Over this is a 1½-in. layer of binder and a 2-in. layer of asphalt. The T-type rails being used are of standard gage, weigh 102 lb. and measure 7¼ in. high. All joints are Thermit welded, making one continuous rail. The devil strip between tracks is 4 ft. 6 in.

Asphalt is being used for street surfacing between rails in place of the old blockstone pavement, but a single row of the stone is placed for toothing on the outer rail of each track. The asphalt gives a far smoother surface between rails than the old blockstone paving and it has been made standard on all new work which is being done by the company.

At important intersections where special trackwork is required, such as crossovers, switches, etc., the International Railway uses night shifts to speed up the construction program and to eliminate delays caused by daytime traffic.

## Medical Dispensary a Shop Feature



**A corner of the carpenter shop closed off by the erection of tile walls provide the Kenmore shops in Akron with a simple, yet adequate, medical dispensary**

WITH the fitting up of a corner of the carpenter shop of the Kenmore shops of the Northern Ohio Power & Light Company, Akron, Ohio, as a medical dispensary and first aid room, a new feature has been added. Two tile walls have been built in one corner to form a room 18x14 ft. The ceiling and walls have been finished with a high gloss, hospital white enamel; the floor has been covered with a brown and yellow fibre tile.

First-aid treatment is given at this dispensary and provision for the handling of necessary later surgical dressings has also been made. Medical supplies for the emergency first-aid kits used all over the system are stored at this centralized point.

# Horse-and-Buggy Speed

## Will Not Do Today

**Scientifically located stops, increased frequency of service, headways, traffic regulations, fare collection, better equipment, instruction of trainmen—all deserve consideration by electric railways from the standpoint of time saving**

CONGESTION, inadequate traffic regulation, slow-moving trucks and wagons, and street cars are among the principal hindrances to traffic movement in large cities. The remedies in the cases of the first three apparently are radical ones, but the street car is physically capable of higher speeds—of such speeds as are regarded safe on city streets—and need not remain in this category of delay producers. Every increase in the over-all speed of the street car, it should be remembered also, will automatically speed up the flow of all vehicular traffic, and thus make possible easier and still faster street car operation. With this foreword, the committee on service betterment of the American Electric Railway Transportation and Traffic Association introduced a report that is a "mine" of ideas for increasing the speed of operation.

Many ideas have been advanced previously, but most of them have been more or less impracticable and have involved too great cost. The underlying thought in the suggestions in this report was to present ways and means of reducing the running time which could be easily effected and which involved no great expenditures. An abstract of this report was published in the Sept. 29 issue of the JOURNAL. The subject is one of such interest and importance, however, that a more comprehensive treatment of the report appears warranted.

The foreword of the report is followed by a brief editorial treatment by the committee on the subject, after which the sources of increasing speed are outlined. The rapidly developed competition which the railway industry is facing from the low-priced automobile and the public's demand for better service has created a need for a definitely improved type of street railway service rather than for a superficial refinement of the old. The American people no longer marvel at the space-annihilating inventions of the Twentieth Century, such as the radio and motor vehicle, and have become impatient with anything which does not compare favorably with the newer means of travel and communication. With transportation revolutionized in the past ten years, it is absurd to attempt to place in competition with the new modes of travel the same railway equipment and operating policies which were considered the last word in "horse-and-buggy" days. The street car operating at 9 m.p.h. was an immense improvement over the horse-drawn vehicle traveling at 6 m.p.h., but this speed cannot compete with the average of 12 to 15 m.p.h. easily attained by the ordinary automobile of today in traffic. People who are accustomed to averaging 12 to 15 m.p.h. through city streets in their own cars object to the relatively low speed of the street car. The consequence is that street railways continue to lose their patrons to the motor vehicle.

With the market already flooded by low-price, speedy automobiles within the reach of almost every citizen, and with a veritable deluge in the offing, the street railway industry, if it is to regain its former pre-eminence as a means of mass transportation or even to maintain its present position, must supply a service which satisfies this demand of the public for rapid riding.

### Sources of Speed Improvement

It cannot be too strongly emphasized that the problem of securing faster operation covers everything that happens to a car between terminals. Approached with this idea, the analysis discloses four main sources of speed improvements: (1) Increasing the proportion of car-run time during which cars can move at a maximum free running speed, and by making full use of such time; (2) reducing the time spent at stops; (3) installing superior mechanical equipment, and (4) training car operators to utilize to the full, opportunities for increasing speed. The means of increasing time during which cars can move at maximum free running speed may be classed, in turn, under the headings: Reduction in number of passenger stops, scientific spacing of cars and location of time points, and traffic regulation.

### Reduction in Number of Passenger Stops

Continuous motion at top speed between terminals is neither a practicable nor a desirable ideal, but reduction in the number of passenger stops is not only feasible but is an important means of increasing speed of operation. In eliminating stops in congested areas, however, it must in all cases be remembered that here the short rider is found, and that if forced to walk in search of a stop he may continue walking to his destination.

Stops to take on passengers can be reduced in number in two ways—directly, by eliminating stopping points, and indirectly, by increasing service. Several methods of eliminating stops have been successfully used in various circumstances. Though reference is made hereafter to the "skip-stop" plan, the "staggered skip-stop," etc., the public use of such terminology is not recommended. The terms are used here for the sake of clarity, but it is believed some other terminology should be devised which would not suggest the idea of less convenient service.

*Relocation of Stops*—Speed of operation can be increased by reducing the number of fixed stopping points and relocating them at so many per mile. These stops

MEMBERS of the Service Betterment Committee, responsible for the report, are: W. E. Wood, president Virginia Electric & Power Company, chairman; A. C. Spurr, general manager Wheeling Traction Company, vice-chairman; R. N. Graham, Pennsylvania-Ohio System, sponsor; Paul E. Wilson, Cleveland Railway, sponsor; J. L. Alexander, Houston Electric Company; A. J. Boardman, Eastern Massachusetts Street Railway; J. F. Craig, Westinghouse Traction Brake Company; L. C. Datz, St. Louis Public Service Company; L. J. DeLamarter, Grand Rapids Railroad; C. H. Evenson, Chicago Surface Lines; D. L. Fennell, Kansas City Public Service Company; D. J. Graham, Winnipeg Electric Company; J. H. McClure, Cincinnati, Hamilton & Dayton Railway; Joe R. Ong, Cincinnati Street Railway; E. A. Palmer, Westinghouse Electric & Manufacturing Company; D. A. Scanlon, Northern Ohio Power & Light Company; D. A. Smith, Department of Street Railways of Detroit; Charles H. Strong, Georgia Power Company; J. C. Thirlwall, General Electric Company; W. E. Thompson, Third Avenue Railway; Claude L. Van Auken, Electric Traction, and C. W. Wilson, Pittsburgh Railways.

need not necessarily be evenly spaced, but should be located at sites which scientific analysis indicates will serve the maximum number of passengers.

*Skip-Stop Plan*—Some cities have increased car speeds by using a skip-stop peak operation, while making all stops during off-peak hours. Under this plan all stops are made during the off-peak hours, and only every other stop during rush hours. Operation during congested periods is thus automatically speeded up. Use of this plan in off-peak hours is possible, but is unnecessary because many stops are not actually made.

*Staggered Skip-Stop*—This plan is similar to the skip-stop arrangement except that during the peak hours and in the off-peak hours, if desirable, a stop is made inbound at one stop and outbound at the next. Any inconvenience to car riders is equalized by this scheme.

*Express Street Car and Local Bus Operation*—Express service, with local bus operation in support, is under experiment in more than one city. Generally, the street cars, being the more economical means of mass transportation, are operated on express service supported by bus operation for local stops.

*Express Street Car and Local Street Car Operation*—Another type of express service is a combination of local and express cars on the same tracks. Such service is suitable only in territory where present headways are not too short and where a fairly infrequent local-car service can be applied.

*Reducing Stops by Increasing Service*—It is possible to increase average car speeds by providing a shorter headway between cars. Putting more cars on the routes means less passengers per car, and consequently, decreases the number of stops which each car has to make, and also the time spent at stops, since fewer passengers board and leave each car.

Frequency of service can be economically increased through the operation of one-man cars. To realize to the full the increased speed potentialities of such one-man operation, it is essential that the most efficient car equipment possible be used.

### Scientific Spacing of Cars and Location of Time Points

To realize on the maximum speed possibilities afforded by the free running time, a system of car spacing is essential. Time points and spacing signals are the devices generally employed to space cars. In this connection some success has been had with dispatching.

*Time Points*—It is unsound to locate time points in an arbitrary manner, rather than in accordance with the carefully analyzed requirements of a situation. The effect of too frequent time points is to slow down cars. A technical study of each property should identify those elements which retard speed and disclose opportunities for securing faster speeds over certain portions of the runs. Traffic conditions vary widely over a city. Even near-by streets differ greatly in traffic density and, consequently, in speed of traffic. The physical barriers to speedy operation met on certain thoroughfares, such as steep grades, small radius curves, congested throats, frequent intersections, etc., should all receive consideration in the selection of time points.

*Spacing Signals*—Automatic, electrically operated signals, properly located, can be used to keep cars properly spaced and to enforce adherence to schedules. When spacing signals are used, cars are dispatched at regular intervals and the automatic changing of lights along the route from red to green informs the operator as to whether he is ahead or behind schedule.

*Headway Recorders*—When the effort to maintain equal spacing of cars is confined to the use of a definite schedule and of inspectors for handling emergencies, the apprehension of incipient trouble is not usually possible, inasmuch as the inspection forces are limited in number in comparison with the territory which must be covered.

By means of certain mechanical devices for recording headway, it is possible to obtain an indelible record of the cars passing and of the time of their passing a certain point. These devices make possible a centralized control of car spacing, and detect incipient service failures much earlier than is possible by a system of personal inspection.

*Decreasing Running Time*—On routes where increased service is not warranted by the traffic, and where, consequently, slow running time is provided, it may be advisable to provide faster movement, to reduce the actual running time and provide a cushion in the form of longer layovers to absorb delays.

### Traffic Regulation An Important Factor

Proper traffic regulation, which makes possible more advantageous use of thoroughfares, is an important means of securing faster car operation.

*Traffic Control Signals*—The stationing of a traffic officer or the installation of electric "Stop" and "Go" signals on congested streets will usually expedite traffic movement, provided adjustment to the respective volumes of the intersecting traffic lines is made. In busy sections, the installation of some co-ordinated signal control system may prove successful, as it has in several cities. However, if the traffic volume does not warrant signals, and if the signals installed are not some form of the co-ordinated type, they may prove an obstacle to rapid traffic movement.

*Police Co-operation at Crossings*—The co-operation of the police in keeping the tracks at stops clear of other

## Sources of Speed Improvement

***I — Increasing the proportion of car-run time during which cars can move at maximum free running speed***

**A—Reduction in number of passenger stops.**

1—Eliminating stops
- (a) Relocation of stops
- (b) Skip-stop plan
- (c) Staggered skip-stop
- (d) Express street car and local bus
- (e) Express street car and local street car

2—Reducing stops by increasing service

**B—Scientific spacing of cars and location of time points.**

1—Time points
2—Spacing signals
3—Headway recorders
4—Decreasing running time
5—Street supervision

**C—Traffic regulation.**

1—Traffic control signals
2—Police co-operation at crossings
3—One-way streets
4—Parking restrictions
5—Heavy merchandise loading
6—Elimination of left turns
7—Segregation of traffic
8—Terminals
9—Street car loading zones
10—Protection of important street car arteries
11—Staggered closing hours

***II—Reducing the time spent at stops***

**A—Loading and unloading passengers.**

1—Collection of fares
- (a) Advance sale of fares (ticket, token, pass)
- (b) Odd-cent fares
- (c) Transfer system
- (d) Hand registers
- (e) "Pay-as-you-pass" collection
- (f) "Pay-enter" and "pay-leave" collection
- (g) Motormen as fare collectors
- (h) Street collectors
- (i) Queue loading

2—Car body design—to aid passenger flow
- (a) Doors
- (b) Seats
- (c) Car steps
- (d) Space around fare box

3—Berthing

**B—Position of stops.**

1—The near side stop
2—The far side stop
3—Mid-block stops

***III—Installing superior mechanical equipment***

**A—Cars.**

1—Motive power
2—Braking
3—Warning signals
4—Car body design

**B—Track layout.**

**C—Power.**

**D—Emergency and wrecking facilities.**

***IV—Training car operators to use opportunities to the full***

**A—Training for speed.**

**B—Trainmen as salesmen.**

**C—Schedule testing crews.**

vehicles, and in giving the street cars the right of way over other traffic by changing signals at proper moments, will expedite car operation. Lights to signal the officers that the car is ready to go could be used to advantage in this connection.

*Parking Restrictions*—Traffic authorities are agreed that the street space now available is not used to the best advantage and that economic losses result from the unnecessarily retarded traffic movement. Primarily, streets are constructed for moving traffic, so that their use for storage purposes should be allowed only when such use does not interfere with traffic. Consequently, in congested districts parking should be restricted. On the very busiest thoroughfares it may be necessary to prohibit parking entirely during the day. This may arouse opposition among merchants and automobile owners, but an educational campaign may be conducted to show the advantages of parking prohibition.

*Heavy Merchandise Loading*—The restriction of heavy loading on congested streets to certain hours of the day or night or to adjacent alleys should eliminate many unnecessary delays. End-gate unloading from vehicles backed at right angles to the curb should never be permitted on busy streets, as this practice interferes with all traffic on the street. Heavy commercial operations, such as the delivery of coal and other bulky material and the collection of garbage and rubbish, could be restricted, with advantage, to the night hours.

*Segregation of Traffic*—The segregation of types of traffic is worthy of consideration. In all probability only partial segregation is possible at present, including prohibiting the use of the more important thoroughfares to certain types of vehicles during the rush hours.

*Terminals*—Underground, elevated, or street-level terminals may be advantageous in congested areas of some large cities. These would allow centralized control and dispatching of cars and, by taking cars from the congested streets, would eliminate many traffic delays.

Prepayment areas, equipped with turnstiles, can be used to expedite loading at terminals and at parks and on private rights-of-way. Since fares are collected at the areas before the car arrives, passengers enter the cars without delay. Provided these areas are equipped with exit facilities, they may be used for unloading purposes, as well, thus speeding up "pay-as-you-leave" car movement.

*Street Car Loading Zones*—The creation of street car loading zones, with proper traffic regulations in support to allow by-passing, should relieve congestion and tend to increase the speed of street car operation. Car loading is facilitated by loading zones, since they enable patrons, unhindered by passing automobiles, to be at the doors of cars when they come to a stop.

*Protection of Important Street Car Arteries*—Cars can be operated with safety at higher speeds when regulations protect street car arteries from sudden intrusions of cross-street traffic. The boulevard-stop plan, requiring all traffic to come to a complete stop before entering certain thoroughfares, will give this protection.

### Means of Reducing Time Spent at Stops

The second large source of time saving is found in the passenger stop. Cars cannot be in motion at all times. They must stop to take on and let off passengers. The elimination of waste motion at the stops which have to be made is therefore an integral part of the general problem of increasing speed.

The loading and unloading of passengers is a factor in this phase of the problem which offers great opportunity for time saving. The problem of handling passengers

divides itself into the sub-problems of fare collection, the provision of facilities which expedite passenger flow, and berthing.

### Collection of Fares

*Advance Sale of Fares (Ticket, Token, Pass)*—Wherever possible, passengers should be induced to buy tickets or tokens in quantity. This practice could be encouraged through publicity and by allowing a sufficient differential between the cash and the token or ticket fare. Some properties are using the pass in various forms—weekly, Sunday, holiday, etc. It has been found to be an agent for expediting movement of passengers through the elimination of cash and transfer transactions between operator and passenger.

*Odd-Cent Fares*—A great deal of delay at stops is caused by change-making transactions. This source of delay cannot be eliminated entirely, but much can be done to make these transactions as simple as possible.

*Hand Registers*—Hand registers sometimes continue in use more because of precedent than because of their actual value. The time losses for which they are responsible should be fully realized, and, where feasible, more modern registration devices should be installed. Hand registration can in some instances be abandoned without loss.

*"Pay-As-You-Pass" Collection*—On center door cars, a "Pay-As-You-Pass" fare collection has been found in some instances to speed up the handling of passengers.

*"Pay-Enter" and "Pay-Leave" Collection*—The system of "pay-enter" collection on cars inbound to the business center and "pay-leave" collection on outbound cars has reduced delay in many cases by distributing the work of the fare collector over the line rather than concentrating it at the busy terminal.

*Motormen as Fare Collectors*—Motormen on two-man cars can sometimes be utilized to inspect passes, collect exact fares and transfers.

*Street Collectors*—Passenger movement may be expedited in congested districts by having unattended doors of one-man cars and the door at the motorman's position on two-man cars attended by a fare collector, at least for transfer transactions.

*Queue Loading*—Queue loading has been used at certain heavy loading points to speed up passenger loading, particularly at factories. This method allows only one passenger to enter the car at a time and also reduces the number of accidents and fare losses.

### Car Body Design—To Aid Passenger Flow

The design of some types of cars has been a direct hindrance to the expeditious handling of passengers rather than an aid. If increased speed is to be obtained it is essential that all parts of a car should be designed to contribute to the rapid handling of passengers.

*Doors*—Doors should be placed where they facilitate ingress and egress, should be adequate in width, and should be equipped with devices that make quick operation possible. The feasibility of eliminating doors entirely, as has been done in several instances, is also worthy of attention.

The over-emphasis on safety is particularly noticeable in the case of door operation. On many properties, the doors are kept closed until the car comes to a stop and they are closed before cars are started again. In some instances interlocking devices have been installed, making it impossible to operate cars with the doors open.

Investigation would probably show that accidents due to open-door operation are negligible. The gain in speed which should result from such operation makes its use a matter deserving of careful attention, especially in congested areas where frequent stops are made.

*Space Around Fare Box*—A large open floor space around the fare boxes is conducive to the expeditious handling of passengers at heavy loading points.

*Berthing*—Some cities have speeded up car movement by berthing their cars at stops or by providing parallel loading tracks at heavy loading points. Under these methods a car does not have to wait until the car or traffic ahead moves on before it can receive or discharge passengers.

### Position of Stops Affects Speed

Different traffic conditions and street situations require different stop locations. Stops may be located at the near or far side of an intersection (i.e., just short of the crossing or just beyond it) or in mid-block.

*The Near-Side Stop*—The near-side stop is preferable in most instances since in general it offers less interference to traffic and eliminates unnecessary stops. At practically every street crossing traffic proceeds in four directions, with vehicles turning constantly from one line of traffic into the lines moving at right angles to it. Since the near-side stop halts only one of these lanes and backs this traffic up within the block instead of the intersection, the other three lanes are free to proceed. At many intersections cars have to stop in any case at the near side of the crossing, either because of traffic control or because of cross traffic; therefore, at ordinary crossings it is believed to be unwise, generally, to locate the car stop at any other position, thus frequently forcing a car to stop twice in a block.

*The Far-Side Stop*—Stops at the far side of intersections are particularly suitable where streets or car lines diverge, for these stops enable traffic bound in a direction different from that of the loading car to proceed on its way without delay. If traffic is heavy, however, a line of traffic may extend across the intersection, thus stopping both traffic lanes. At "Y" intersections and on streets of adequate width to permit vehicular by-passing, this objection is not serious.

*Mid-Block Stops*—The mid-block stop can be used in light traffic sections to make one stop take the place of two located at both ends of the block, or in special circumstances, as when street or track repairing is under way. With this type of stop, however, it is frequently necessary for traffic to stop at the ends of the block also in cases where traffic is controlled or where cross-street traffic is heavy. Moreover, the mid-block stop tends to increase jay-walking, which many cities are attempting to eliminate.

### Superior Equipment a Means of Increasing Speed

The discussion so far has dealt primarily with ways and means of securing superior performance out of present equipment. It is believed that perfect performance of this equipment will be found inadequate to meet the stiff automobile competition, and that fast, lightweight, strictly modern cars, more power, and better maintenance are necessary, also, to enable the railway industry to maintain its position, not to speak of winning back lost ground.

*Motive Power*—Ample motor capacity, with a proper gear ratio to enable a car to take and keep its place in fast-moving traffic at all times during the day, is essential.

To prevent automobiles from getting ahead of cars after a traffic stop, and thus from swinging onto the tracks and blocking rail traffic, the cars must be equipped to accelerate at least as rapidly as the automobiles.

*Braking*—The attainment of faster speeds must be accompanied by corresponding developments in deceleration. For cars to maintain high speeds between stops, brakes must provide rapid deceleration. The increased hazards developed by increased speeds must be counteracted by superior braking. In this connection, variable load, dynamic and magnetic braking, and other devices are in operation and are being further developed.

*Warning Signals*—Instead of the traditional gong, up-to-date warning signals operating by air or electricity may be installed. These signals can be heard above the din of present-day traffic, and should aid materially in moving the cars over congested streets.

*Track Layout*—Improper track layout and poor maintenance create delays which slow down car movement. Non-clearance curves and improperly located sidings on a single track make it physically impossible to maintain fast schedules. Switches that give the crews trouble in throwing, bad curves, run-down special work, and low joints in particular make low speed necessary. Hand signals should be replaced by automatic signals, so that operators need not leave their cars to operate them. Automatic switches should also be installed wherever possible.

*Emergency and Wrecking Facilities*—The effect of higher speeds will be occasionally lost unless an efficient emergency and wrecking service is available to keep the tracks open in case of breakdown or blockade. Adequate maintenance and inspection of the cars and overhead lines, by decreasing breakdowns, will aid in keeping the cars on schedule.

### Increasing Speed by Educating Car Operators

*Training for Speed*—Car operators must be trained to take advantage of every opportunity for rapid operation, if the full possibilities of increased speed are to be realized. In the past, safe handling of the cars and safety in general have at times been over-emphasized and the need of reasonably rapid operation has been unduly subordinated.

To obtain the full benefits from the measures and methods proposed for securing decreased running time, it will be necessary to impress upon the trainmen the importance of greater speed and convince them that it can be obtained without sacrificing safety. Confidence in the ability of the brakes to stop the cars in emergencies must be instilled in the operators' minds. They must receive training in the rapid acceleration of cars, so as to enable the cars to start at "GO" signals before other vehicles, and to remain ahead of them between stops.

Improvement in the handling of passengers can be secured if the platform men are trained to call stops clearly and in advance, to supply information in a courteous manner concerning the use of doors, the importance of moving up into the cars away from the platform, etc.

*Trainmen as Salesmen*—The platform men are the salesmen of the railway industry, the medium through which personal contact between the management and the public is made possible. In order that they may contribute intelligently toward the solution of the problems facing the industry, such as speed, they should be acquainted with the facts of operation.

Instruction in courtesy, cleanliness, loyalty and honesty is essenital, but for the men to be in position to co-operate most effectively with the management, they must also be informed concerning its problems. When the trainmen understand the competition which the street railway industry must meet from motor vehicles, and the necessity which has been forced upon it to increase the speed of its operation, then these trainmen will utilize those seconds of delay, which, soon mounting up into minutes, now cause the street car to lag so far behind the automobile.

*Schedule Testing Crews* — Something beyond mere planning for speed of operation and endeavors to sell to trainmen the idea of speed is necessary to secure complete and uniform accomplishment. The years of relatively slow operation have imprinted in the minds of some train operators rather permanently the idea that speed such as is necessary will be difficult to attain. A corps of engineer-operators or expert trainmen who are available, when the study of a line indicates that a certain speed can be maintained, to take over the line and by actual operation demonstrate the feasibility of the schedules suggested, would without doubt form a highly effective means of increasing speed on a system.

## Mitten Tours Open Additional Terminal



**Auxiliary terminal for Mitten Tours at 1432 Market Street, Philadelphia**

TO CARE for its growing long-distance motor coach business the Philadelphia Rapid Transit company recently opened another terminal and waiting room at 1432 Market Street, Philadelphia. This location, which is adjacent to the Mitten Bank, is opposite the Broad Street Station of the Pennsylvania Railroad Company and close to the City Hall. The main terminal at Broad and Locust Streets will continue, but all buses for New York, Atlantic City, Washington, Wilmington, Doylestown and Valley Forge will stop at the new terminal on their way in and out of the city. A complete information bureau will also be maintained here and tickets will be sold to all points served by the extensive Mitten Tours system.

# Vienna Helps th



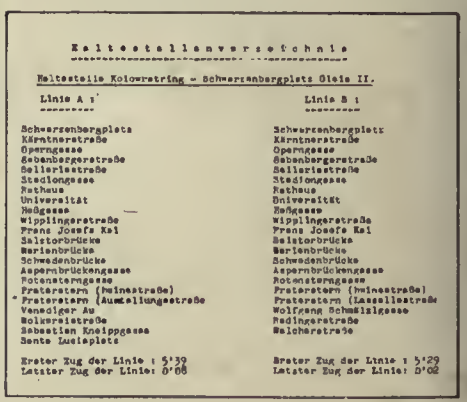

THE view above shows earlier and more common form of stop sign at a double berthing street platform. The numbers relate to car routes.

AT THE right is a later form of "stop" post made of iron with painted glass panels, partly to carry advertising and partly to give the traffic information hereinafter presented.

THE center view at the left shows the front page of "Information for Passengers" booklet sold for about one and one-half fares. The front page carries directions concerning lost articles and complaints. Consecutive pages give respectively: General data on the city and system; fares; route marks, destinations, running time and first and last cars; miscellaneous hints for patrons, including pictures of "stop" posts; order of stations and inter-station running times with first and last trains of the rapid transit "Stadtbahn"; first and last cars on individual city routes; miscellaneous regulations, including note on emergency brake; motorbus routes with map and description of ticket-selling automatic machines; schedules of bus routes; best single routes or combinations of transport services to reach important places and on the last page a list of ticket agencies.

DIRECTLY over each map is a list of the stops on the routes pictured, outbound or inbound, from the particular stop where this is posted. These stop names are painted on a glass panel. The data include first and last cars.



Haltestellenverzeichnis

Haltestelle Kolowratring – Schwarzenbergplatz Gleis II.

| Linie A 1: | Linie B 1: |
|---|---|
| Schwarzenbergplatz | Schwarzenbergplatz |
| Kärntnerstraße | Kärntnerstraße |
| Operngasse | Operngasse |
| Gebenbergerstraße | Gebenbergerstraße |
| Sellerlestraße | Sellerlestraße |
| Stadiongasse | Stadiongasse |
| Rathaus | Rathaus |
| Universität | Universität |
| Roßgasse | Roßgasse |
| Wipplingerstraße | Wipplingerstraße |
| Franz Josefs Kai | Franz Josefs Kai |
| Salztorbrücke | Salztorbrücke |
| Marienbrücke | Marienbrücke |
| Schwedenbrücke | Schwedenbrücke |
| Aspernbrückengasse | Aspernbrückengasse |
| Rotensterngasse | Rotensterngasse |
| Praterstern (Heinestraße) | Praterstern (Heinestraße) |
| Praterstern (Ausstellungsstraße | Praterstern (Lassallestraße |
| Venediger Au | Wolfrang Schmälzgasse |
| Holzerlestraße | Radingerstraße |
| Sebastian Kneippgasse | Melcherstraße |
| Sonte Luciaplatz | |
| Erster Zug der Linie : 5'39 | Erster Zug der Linie : 5'29 |
| Letzter Zug der Linie: 0'06 | Letzter Zug der Linie: 0'02 |

INDIVIDUAL maps of this kind are placed on a panel of the new "stop" columns to show the course of every route (outbound or inbound as the case may be) from the point where the map is displayed.

# Passenger to USE ITS SERVICE




AT MORE important points, are handsome glazed shelters, in which system time tables are posted, reading in 24-hour time. A number of these stations are combined with automatic telephone booths. By agreement with the telephone company, the original street railway telephones have been discarded. Each supervisory official has a key to give him free access to these automats. Platform men who make service calls receive a refund to cover their outlay in coin.

Passenger handling is facilitated as 24 per cent of the passengers provide themselves with tickets purchased in advance of boarding the cars because such tickets may be purchased for 26 groschen (3.64 cents) instead of 28 groschen (3.92 cents) on the car. Another 24 per cent use transportation sold in the form of passes.




AS THE car approaches, the passenger is apprised of the route name by the front dasher sign and by the illuminated route number over the hood. As the car stops, he can read a window placard which supplements the route name by giving the main streets or places passed. The route number is repeated by a window marker and is also on the rear hood.



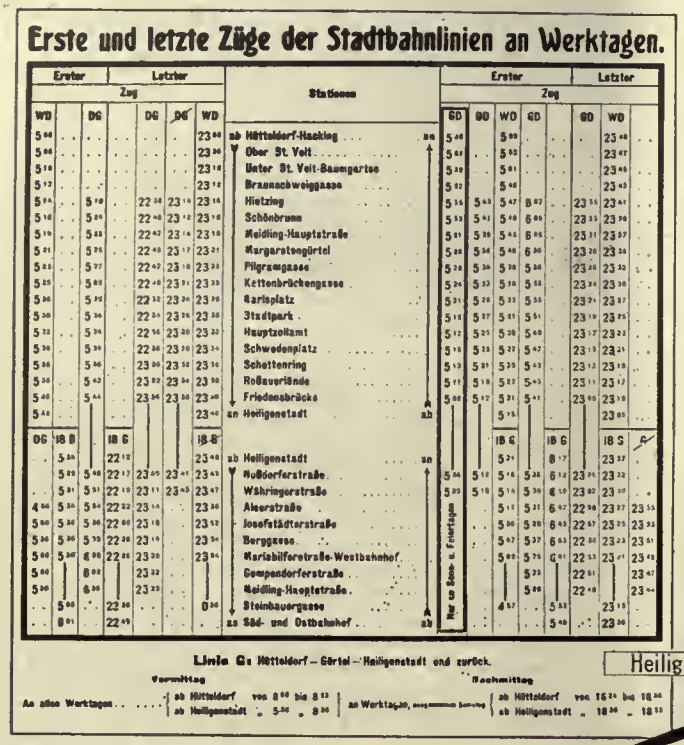

**Prater Lusthaus**
**über Opernring Erdbergstr.**
**Kaiser Josefs-Brücke**

THIS is a typical window card. It shows that the Prater Lusthaus (pleasure pavilion) is reached via Opera Belt, Erdberg St. and Kaiser Joseph's Bridge.

THE shape of the Stadtbahn car vestibules leads to the placing of the destination signs off-side as shown. It will be noted that the dividing rail on the platform is wound with wire to give a firmer hold to the passenger. The division for entrance and exit has proved impracticable, but the rail is retained because of its value as a support.



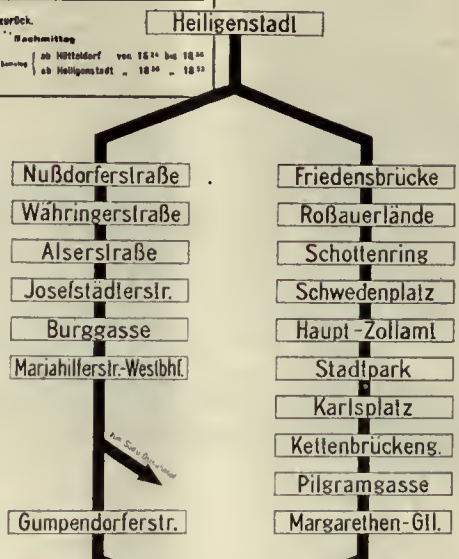

INSIDE a city car, the passenger can orient himself by reading the inner side of the route card. On the Stadtbahn, the name appears over the doorway. Note the use of cabinets for the control equipment.




ALL stations of the Stadtbahn are posted with schedules like this showing the first and last trains of each route at the various stations. The initials "WD," "DG," etc., are route designations.

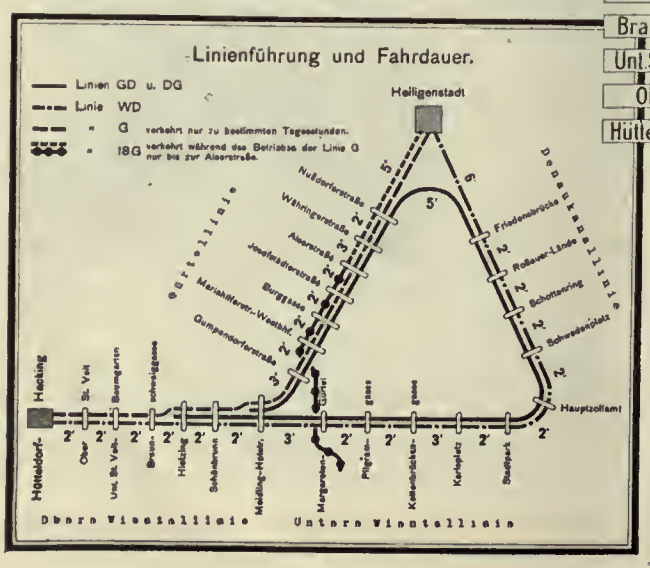


THIS motorbus, now used for short-haul inner-city service, carries its route sign on the sides, in addition to the illuminated route symbols at front and rear.




THE Stadtbahn was converted from a sick steam railway to a healthy electric railway, and is now carrying 110,000,000 passengers a year instead of the 40,000,000 formerly carried by steam. It is a rapid transit system operated as a part of the street railway system with free transfers to the street railways. These transfers are used by some 90 per cent of the Stadtbahn riders. This order-of-stations chart appears in large form on the station walls of the Stadtbahn, and in small form as enameled shields on the car doors.

THIS skeletonized layout of Stadtbahn routes is also posted on station walls and in the cars. It shows each route in a separate color or style of line, and gives the running times between stations.







ON EVERY glazed-type "stop" pillar used for bus traffic, there is painted a map which shows the course of each route in relation to buildings, monuments, parks and other places of special interest. The route symbol and name of terminus are also given.



**The storage yard with its 24 tracks has a capacity of 183 cars. Three lead-ins and interconnecting tracks give great flexibility in the movement of cars**

# Brooklyn Car Terminal Enlarged

**Many improvements incorporated in the remodeled Canarsie shop and storage yard of the Brooklyn-Manhattan Transit Corporation. New depot with recreation room for the trainmen and ample office space has been added**

MODERN in every detail is the recently remodeled Canarsie car terminal of the Brooklyn-Manhattan Transit Corporation. The terminal now has a well-arranged track storage system, a seven-track car repair shop with modern machinery, and a new depot with headquarters for the trainmen and offices for the division superintendent, the depot master, transfer clerk and dispatch clerk. Before the changes were made the shop was inadequate, the storage tracks were not arranged for the most efficient handling of cars, and the trainmen had no recreation rooms. Now the plant is equipped in every respect to accommodate the men and cars of the seven lines which use it.

The new depot, which occupies a corner of the large plot, is a 2½-story structure of fireproof construction. The building has an archway on one side with two tracks which lead from the storage yard to Rockaway Avenue, on the east side of the plot. The starter's office is located on the ground floor, as well as a locker and washroom for the shop employees and toilet rooms for both the shop men and depot forces. A steam heating plant also is located on this floor and space for storing coal.

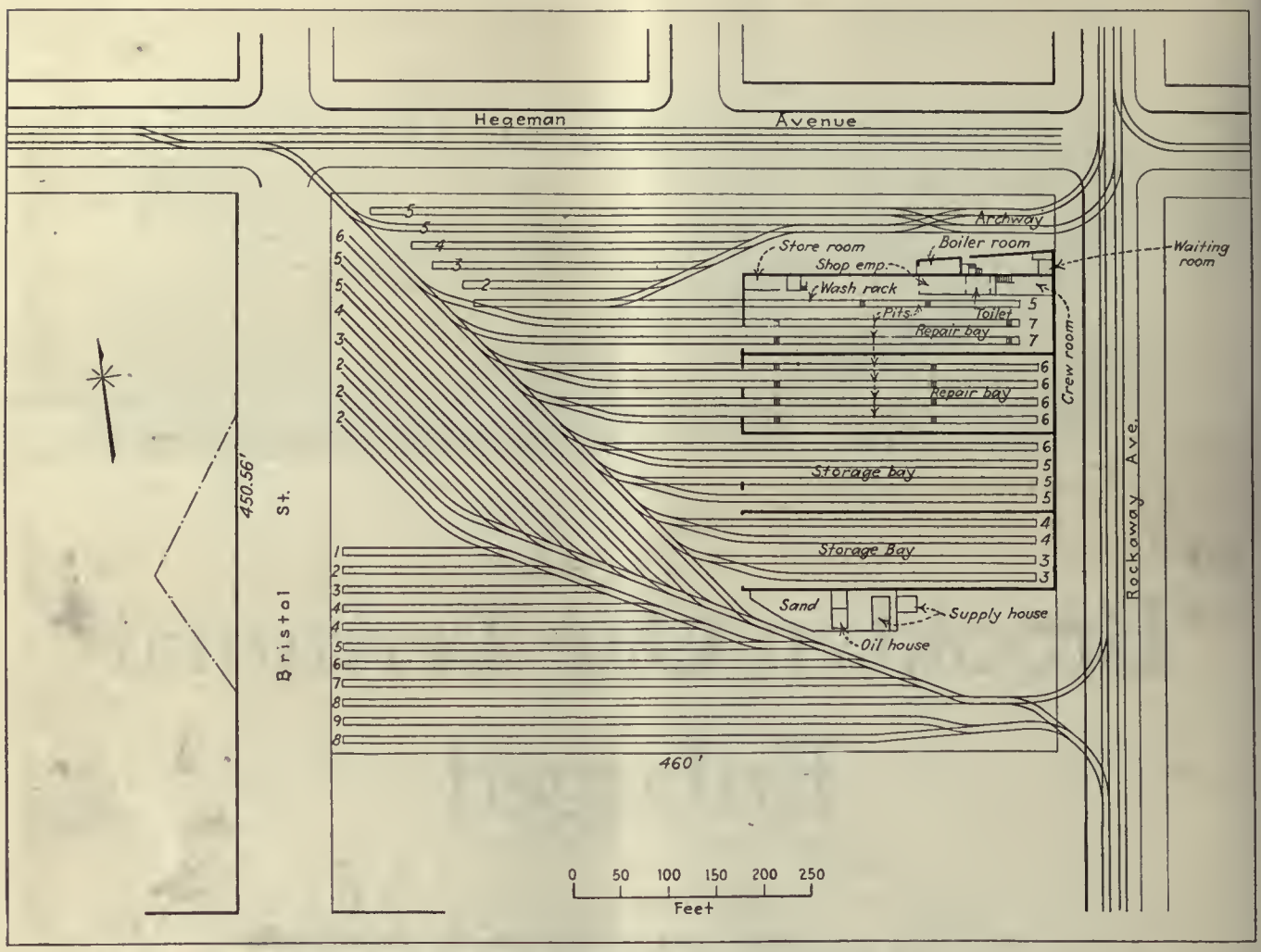
A stairway from the ground floor entrance on the north side leads to a mezzanine floor, which is used for a locker room and washroom for the car crews. The second floor proper, above the mezzanine, has a large assembly room for the trainmen, a locker and washroom, a partitioned office for the transfer and dispatch clerks, and offices for the division superintendent, the depot master and the stenographic department. The floor has windows on three sides, giving it a pleasant atmosphere.

### Large Recreation Room for Trainmen

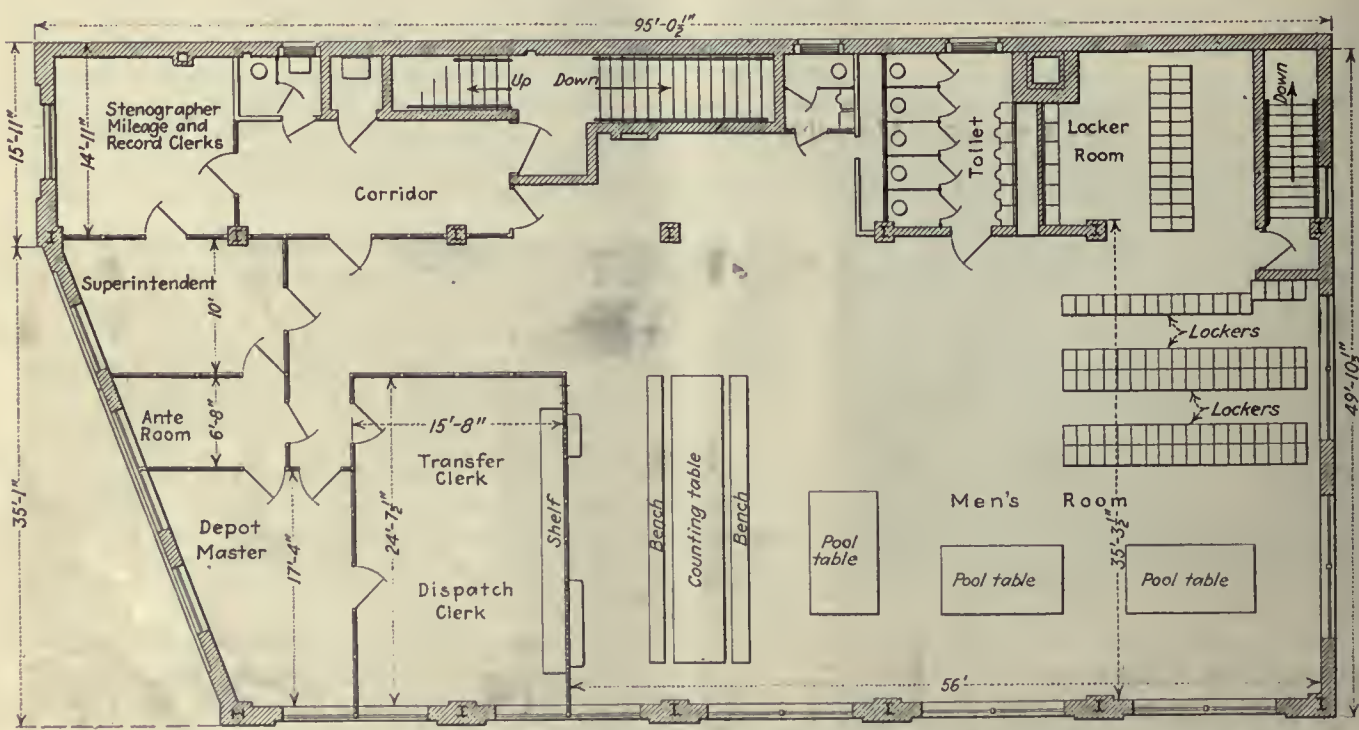
The assembly room, which occupies more than half of the entire floor, is well equipped for the trainmen. It has three pool tables, checker tables and chairs, and a long counting table, with a double set of compartments for the use of conductors making up their reports. Bulletin boards for announcements of interest to the crews also are located in this room.

The large office for the dispatchers and transfer clerks adjoins the crew room and has windows opening into the crew room, so that conductors and motormen can transact their business without entering the office. The other offices are grouped at one end of the building. The depot master's office is in the corner of the building, overlooking the two streets at the corner of the plot. The division superintendent's office is in the center of the group, and the room for the stenographers and record clerks is in the other corner.

A large number of the lockers are located on this floor. Three hundred lockers are provided in the entire build-




Cars may enter the storage yard from three lead-ins. These are so interconnected that cars can be moved from any group of storage tracks to another group or into the repair shop




The second floor of the new Canarsie depot has a large assembly and recreation room for the trainmen and a number of offices

ing, and of this number 298 are being used. The company plans to add 50 more, so that with an increase of men there will be no need for doubling up. In the depot master's office is a case with duplicate keys for each locker and a master key.

Four carhouse bays adjoin the new depot building. These bays formerly were open at both ends and the tracks were joined to the tracks on Rockaway Avenue, on the east side of the building. When remodeled the



**The new depot at the extreme northeast corner of the plot is a 2½-story structure of fireproof construction**

Rockaway ends of the bays were closed and the tracks extending into the street removed. Two of the bays, each having four tracks, are used for storage only.

### Bays Well Equipped for Light Repairs

The other two bays, nearest the depot, are used for a car shop. These were enlarged during the reconstruction program and four inspection and repair pits added. The artificial and natural lighting facilities also were improved and several new machines were installed. The second bay from the depot has four tracks, each accommodating three cars and having an inspection pit. These four pits were constructed in the recent program. The pits are used for the schedule inspection of cars as they complete the mileage allowed between inspections, and some 20 to 25 cars go through the inspection daily. All motor and truck repairs are made in this bay, about eight cars being repaired each day. At the rear of the four tracks are located the machine and blacksmith shops,



**The counting table where the conductors can make up their reports. The office for the dispatchers and transfer clerks may be seen in this view**



**Pool tables in the recreation room may be used by the trainmen before and after runs**

which have all the necessary machines and tools for light repair work. An air compressor in the machine shop supplies air for the various pneumatic tools used in the repair work. Other equipment includes a lathe compressor, drill press, work bench, a forge and two armature racks. An overhead 5-ton crane travels the full width of this bay, so that materials can be transferred



**Storeroom at the rear of the car track for working tools and materials**



**Locker and wash room for the shop employee, showing the large wash fountains**



**One of the two car shop bays. Repair work of a minor nature and light overhauls are performed in this section**

from one pit to another or from the machine shop section to any one of the pits. At the extreme rear of this section is located a fireproof oil house with a 12-in. wall and a heavy door. Lubricants, paint and other inflammable materials are stored in this room. At the same end of this bay is a shop office.

The bay adjoining the depot has three tracks, two of which have room for four cars and the third of which accommodates three cars. Inspection pits extend almost the full length of two of the tracks. A shorter pit was constructed for the third track. All of the pits are of concrete and are well lighted and heated. Only inspection work and light repairs are made in this particular bay.

### Separate Track for Washing Cars

On the track with the short inspection pit is a rack for washing cars. There are two water troughs on each



**A 5-ton overhead crane and other necessary machinery for light repair work are located in this machine and blacksmith shop at the rear of one of the car shop bays**



From 30 to 35 cars are washed every night on this car wash rack

side of the rack, extending the full length of a car. The two troughs nearest the track are used for fresh water, while the other two are used as spillways leading to the sewer. Car washers dip their brushes in the clean water and wash the windows and sides of the car. With this arrangement it is possible to wash from 30 to 35 cars each day. Three cars are run into the shop on this track at a time and the one nearest the door is brushed and swept on the interior. It is then moved on to the wash rack which is near the door, and while it is being washed, the second car is cleaned on the inside. The clean car is then moved outside and the second one moved into



The inspection pits are of concrete and are well lighted and drained

place on the wash rack. Along a section of the north wall of this bay are numerous racks and bins for the storage of heavy parts. Along the remaining section of this wall there will be a carpenter shop. At the extreme end of the bay is a storeroom where working tools and materials are kept in their individual racks and storage bins. The locker room and washroom for the shop employees are on the ground floor of the depot. The washroom has two large Bradley wash fountains and numerous lockers.

Each of the shop bays is equipped with steel roller doors. These are kept closed during the cold weather, but are easily moved so that no great inconvenience is caused. In remodeling the car shop the roof of the second bay, which was formerly of wood, was removed and skylights erected in their place. The new roof permits the entrance of ample daylight to permit a great deal of the repair work to be done without artificial illumination.

### Storage Yard Tracks Arranged for Maximum Flexibility

The storage yard covers an area of 161,000 sq.ft., and has a capacity for 183 cars on its 24 storage tracks. There are three separate track leads to the yard, so that cars can be moved to and out of the yard at any time of the day with no difficulty. The terminal serves seven car lines which requires a maximum amount of flexibility. One lead is to Rockaway Avenue, and passes under the archway of the depot building at the northeast corner of the yard. Another track leads to Rockaway Avenue and leaves the yard at the southeast corner of the plot. The third lead is to Hegeman Avenue and leaves the yard at the northwest corner. The yard tracks all have been reconstructed and most of the floor of the yard has been paved. The lead-in or ladder tracks are so interconnected that it is possible to switch cars from any group of tracks branching from a lead-in to another group. The tracks leading into the inspection pits and storage bays also can be reached from the various lead-in tracks, making the shop accessible for the cars of any line which need repairs.

## Anti-Friction Bearings and Special Trial Drives at Vienna

LIKE many other European electric railways, the Vienna Municipal Tramways uses anti-friction journal bearings on a large scale. It now has 100 trail cars with roller bearings in every-day operation. Another 100 trailers have been equipped with a French bearing of conventional design, termed "Isothermos," which is designed to let oil be thrown on the bearings centrifugally with no need for waste or packing.

Experiments are also under way with ten cars having various types of drive. All of these cars have roller-bearing journals, but the drives differ. Two are to be of Cardan type, two of worm design, two of Buchli 1 : 9.5 drive with radial axles and body-hung motors, and two more of double reduction gearing run in oil, etc. Two cars will be equipped with the automotive style of levers and disk brakes. The high-speed 1,300 r.p.m. motors to be tried will be of 45 kw. or 60 hp. rating.

In general, these ten cars will be studied from the laboratory and research viewpoint with the idea of applying the knowledge gained to the design of future equipment.

# Commissioners Urge Need for Interstate Bus Regulation

REPORTS and addresses bearing upon a number of important questions of direct interest to utility and local transportation executives occupied the attention of state regulatory officials during the 40th annual convention of the National Association of Railroad and Utility Commissioners, held at New Orleans, La., Nov. 13-16, 1928. These included the questions of interstate bus regulation, the present investigation of public utilities under the Walsh resolution, and the conservation of street and highway space through regulation of commercial vehicles using the streets.

J. P. Barnes, president of the American Electric Railway Association, addressing the commissioners on behalf of the local transportation industry, suggested the need for regulation of taxicabs and other commercial users of the public streets, in order that destructive competition may be eliminated and congested street space conserved. "Commercial use of the public streets must come more and more completely under public control and regulation," said Mr. Barnes. "Already this principle is well defined in the franchise and regulatory restrictions surrounding the commercial operation of street cars and buses. To some degree and in some communities it is recognized in the operation of taxicabs. Not yet has it been extended to the commercial operation of trucks and delivery vehicles. But recent developments in taxicab operation in some centers are tending to demonstrate the necessity of a firm public hand on this commercial use of the city's property in its streets." An abstract of Mr. Barnes' address is printed elsewhere in this issue.

### Impatient With Bus Regulation Delay

Considerable impatience with the delay that has been experienced in the attempt to bring about federal legislation for the regulation of interstate bus operation, was expressed in the discussion of the report of the special committee on motor vehicle legislation presented by John E. Benton, chairman, general solicitor of the association. An entire evening session was devoted to the discussion of the report and to addresses bearing on the motor vehicle question by representatives of several interested groups. These included Ivan Bowen, former Minnesota commissioner, counsel for Motor Transit Management Company, H. L. Brown, general counsel National Automobile Chamber of Commerce, and S. A. Markel, chairman legislative committee American Automobile Association. Mr. Bowen held that regulation should not extend much beyond the requirement of a certificate of convenience and necessity. In his address, which is abstracted elsewhere in this issue, he also questioned the practicability of the attempt to delegate regulation of interstate carriers to the state commissions through the machinery of the Parker bill.

Mr. Markel outlined the attitude of the Bus Division of the American Automobile Association and expressed the hope that a reasonable bill for the regulation of interstate buses could be passed by Congress promptly. He said that conferences have been held recently with the several groups interested in this subject and that a modified bill embodying an attempt to eliminate some of the objections raised against the Parker bill had been drafted for purposes of discussion. Speaking for the operators of motor buses, Mr. Markel said: "We are extremely anxious to have a reasonable bill enacted by Congress promptly. We are willing, if no violence is done to principles, to accommodate our views to those of our conferees wherever possible. The Bus Division has not acted upon the proposed draft of a bill which has recently been prepared. In my opinion, however, any practical bill which would permit the orderly growth and development of motor bus transportation would be agreeable to the Bus Division if it met with your approval."

### Mr. Brown Explains N.A.C.C. Position

Charged with broken faith on the part of representatives of the National Automobile Chamber of Commerce in opposing the Parker bill at the hearings before a committee of Congress, Mr. Brown explained that he considered the machinery of the Parker bill to be inadequate and unworkable. He said there is no disagreement by any group on the need for certificates of convenience and necessity for interstate bus operation. He suggested further that there seems to be general agreement that it is desirable to utilize the experience and knowledge of state regulatory commissions in the granting and control of certificates. To accomplish this, while at the same time overcoming the objections to the machinery of the Parker bill, Mr. Brown suggested that applications for certificates for interstate operations be made directly to the Interstate Commerce Commission and referred automatically for hearings and reports, to boards made up of one representative from each state affected by the application, selected by the Public Utilities Commission or whatever other board may in each state be charged with the regulation of intrastate commerce.

Commissioner J. S. Benn of Pennsylvania again repeated charges of bad faith directed against representatives of the N.A.C.C., which he had made preceding Mr. Bowen's address. He took exception also to the inference in Mr. Bowen's address that state commissions in either state regulation or proposed national regulation of buses have approached the matter of determining public convenience and necessity from the standpoint of protecting the railroads, existing bus lines or other forms of transportation.

Referring specifically to the effort to obtain national legislation for the regulation of interstate buses, Commissioner Benn said that there has been a process of whittling down the scope and authority of the state commissions in proposed legislation to the point where little is left. He charged that the National Automobile Chamber of Commerce had broken a gentlemen's agreement to support proposed legislation before Congress, provided certain railway groups agreed to eliminate the provision for the regulation of trucks as well as buses in the proposed bill.

After considerable further discussion of this subject, the commissioners voted to continue their committee on motor bus legislation, with power to act in co-operation with the committee on state and federal legislation. The committee was instructed to work for adoption in any law which is passed, of the principles of the Parker bill with such minor modifications in machinery as may seem desirable.

### Report Made on Walsh Resolution

First vice-president L. E. Gettle, chairman of the special committee on the Walsh resolution for the investigation of public utilities, presented a report outlining the reasons for the formation of this committee and the steps

taken regarding this investigation. In making this report Mr. Gettle strongly condemned the suggestion by members of the U. S. Senate tending to impute the motives of himself and members of his committee in appearing before the Senate interstate commerce committee in the hearings on Senate Resolution 83, introduced by Senator Walsh of Montana.

Louis E. Gettle, chairman of the Wisconsin Railroad Commission, was elected president for the ensuing year. Charles Webster of Iowa was elected first vice-president, and A. J. Maxwell, North Carolina, second vice-president. Glacier Park, Montana, was selected as the location for the next meeting, which will be held beginning Aug. 27, 1929.

# Wider Regulation of Commercial Vehicles Needed

**Opinions expressed at New Orleans meeting that the use of the streets is a matter of public concern and should be under public control**

*By J. P. Barnes*
**President American Electric Railway Association**

THE local transportation industry has learned that its right of survival is based not on an investment made or a plant constructed, but on a service rendered. We have learned that by our service we shall be judged and by the measure of its usefulness shall we be rewarded. With our acceptance of new types of vehicles has come the adoption of a new philosophy that the street car must and shall be used where and only where it best suits the needs of mass transportation; that the bus, large or small, shall by the same test be assigned its proper place in our operations; that we will not fear that which is new either in vehicle or method. We have cast our problem in terms of transporting comfortably the largest number of people at the smallest cost and we have refined and perfected the efficiency of these operations. We have insisted that as our vehicles serve the largest groups of travelers they should have, to a degree, preferential use of the streets. In this our insistence has been greater than our accomplishment, for today the individual vehicle moving and standing throws so heavy a burden upon the traffic arteries of our city that all movement is impeded. Imagine a railroad using two of its four tracks for a storage of cars while the other two were so crowded as to reduce operation to half speed or less, and you have the prototype of conditions in the present city street.

Along with this crowding of arteries has grown quietly and to a degree unrecognized a further taxing of horizontal facilities through the tremendous development of vertical transportation, which has brought about great concentrations of population in high buildings without corresponding enlargement of traffic facilities to and from their locations.

Our problem has grown from its initial dimensions of mere carrying of groups of people with speed, safety and convenience. By the addition and multiplication of individual vehicles and the population concentrations it has expanded to the point of developing a new limiting feature, namely, street capacity, and has become the problem of the community. To sustain community activity a free circulation of traffic from part to part is as essential as is free circulation of blood in the body. Already, due largely if not wholly to the difficulties of traffic, branch stores, branch banks and neighborhood shopping centers, are everywhere developing. It may or may not be that this decentralization is a step forward even though difficulties and complexities of administration be increased and inventories multiplied. What is important is that these developments are taking place not as a result of economic study and sound merchandising, but mainly because of the sheer physical difficulty of getting from place to place in a busy American city. Far be it from a street railway man to decry or discourage the tendency to move about, but if the combination of this tendency with inadequate physical facilities for its indulgence is already affecting the habits of communities, then it is time that all agencies socially or economically concerned with those habits, pause to take stock.

Too many traffic engineering studies result only in recommendations for mere temporary relief. Too many city plans reflect the architectural or landscaping genesis of the planner. There must be profound fundamental study and understanding of all the elements and influences that affect the growth and habits of communities. It is a fundamental and general problem and will yield only to the co-operative effort of all interested groups. There is no place for individual or class selfishness in developing the movement which is the life of the modern community, but there is abundant place for a service of high order.

The transportation problem of a modern city involves and includes all of its transportation. The city's transportation plant includes every vehicle and every public way in the city. The load factor on this plant is highly irregular and at times parts of it are grievously overloaded. At the points of greatest overload the least adequate of the facilities are the streets themselves and their inadequacy is frequently exaggerated by their partial use for storage purposes. Multiplication of vehicles in the future, as in the past, cannot but aggravate an already burdensome condition. Relief lies not in the addition of vehicles to the city's transportation equipment.

The use of the streets is a matter of public concern and is, of course, under public control. Commercial use of the public streets must come more and more completely under public control and regulation. Already this principle is well defined in the franchise and regulatory restrictions surrounding the commercial operation of street cars and buses. To some degree and in some communities it is recognized in the operation of taxicabs.

Not yet has it been extended to the commercial operation of trucks and delivery vehicles.

Recent developments in taxicab operations in some centers are tending to demonstrate the necessity of a firm public hand on this commercial use of the city's property in its streets. There are two plans of taxicab exploitation in operation, different in detail but alike in that each tends to wipe out by destructive competition that adequate and acceptable service which every modern city requires.

Under one plan the manufacturer encourages some operator to extend his fleet until his cash and credit resources are completely embarked in the operation. The same or another manufacturer then points to the operator's success and enlists some competitor operator in a similar enterprise with the result that more service is offered than necessary. Usually a price war develops in the course of which both operators become so hard pressed that service and maintenance alike deteriorate. One or both of the operators may fail, which is an individual chance and an individual misfortune. The important thing is that in the process of elimination the service has failed and the city has been deprived perhaps for a considerable time of that adequate service it desires and which it could have if it controlled the use of its own streets in its own interest.

The other plan, which is spreading rapidly, is for the operator to purchase a fleet of cheap cars which he rents by the day to individual drivers. The owner of the cars receives a fixed rental from the driver and is consequently not interested in the gross earnings of the cab. Consequently the venture is usually inaugurated with some such ridiculously low rates as two or three miles for a quarter. Novelty produces enough initial business to encourage expansion to such degree that, as in the other case, the city is over-cabbed and the elimination process works out with precisely the same effect upon the public service.

Competition may be the life of trade, but regulation is the life of public service. Destructive competition is no longer permitted in the field of the established public utilities, but in how many new directions must the community apply the proven principles of regulation in the future? Obviously in all which threaten a breakdown or a dangerous overload of the basis transportation facility—the streets. Only by the application of regulatory practice can the public protect itself from the hazards of useless duplication and destructive competition.

In the course of study of such things as these, it has been vividly impressed upon our industry that new times have brought new problems and that new methods must be devised to meet them. The American Electric Railway Association has visualized the problem of its industry as one of public transportation, not merely of street car operation. We have made a start and are rapidly broadening our activities to include studies of the fundamental problems of modern public transportation. We have turned our backs upon the superficial expediencies which have served as temporary solutions in the past and we are looking forward to solutions based on correct application of sound fundamentals. We are studying the economics of our industry, not from the narrow viewpoint of past methods and present equipment, but in search of the way by which we may render the maximum of public transportation service in every direction and with every available means. There is a place in the modern community for general co-ordination of public transportation services. That place we mean to determine to define and, if we may properly do so, to occupy it as well.

Our committees are seeking to define the economic foundations of street traffic, of fare structure, and of public transportation co-ordination. The expansion and adaptation of our service must be based upon these fundamentals and so based will not fail to merit and receive the rewards of public approval. Only by continuing to render a useful public service can we establish our right of survival, and only by increasing our service can we keep abreast of a rapid development which is taking place about us.

# Have You Received Your Copy of Instructions and Rules for the Contest?

AN ATTRACTIVE folder giving full information and suggestions for preparing items for submission in ELECTRIC RAILWAY JOURNAL'S Maintenance Contest has been sent to electric railway officials and department heads. Additional copies for posting on bulletin boards or distribution among maintenance men are available. Let us know your requirements.

Material entered in the new contest is coming in with each mail. The sooner you get started the greater opportunity you will have of winning one of the valuable prizes. Don't delay in getting started. There is no limit to the number of items that may be sent in by one person. The more you submit the better chance you have of winning one or more of the big prizes. Some companies are organizing all maintenance departments to go after the award. Look up the announcement in the Oct. 20 issue of the JOURNAL or send for copies of the instruction folder.

The main individual prize of $200 will be awarded at next year's annual convention to the person submitting the best maintenance idea during the contest. There are twelve $25 departmental prizes to be awarded to individuals sending in winning maintenance ideas. These will be divided equally between the following four maintenance divisions:

1. Rolling stock and shops.
2. Way and structures.
3. Electrical and line.
4. Buses and garage including shop equipment for bus maintenance.

An attractive trophy will go to the company making the greatest contribution to improved maintenance through participation in the contest and special certificates of merit will be awarded to each department making the best individual showing. Each item published will be paid $5 for regardless whether it wins a prize or not. Read over the instructions and conditions and send in your material.

# Bus Regulation Should Not Be Restrictive

**In these views presented at New Orleans it is held that effective federal regulation of interstate operations requires little more than the issuance of certificates of convenience and necessity**

*By Ivan Bowen*
**Counsel for Motor Transit Management Company**

SINCE the beginning of the current year, the first regularly scheduled motor bus service has been put into operation between Chicago and New York. Now there are at least four separate lines with regular service between the two points, each operating several schedules daily. There are two lines, which either directly or by traffic interchange carry passengers between the Pacific and Atlantic Coast on regular schedules. As to a considerable portion of their route, both of these lines operate only interstate, being prohibited from carrying passengers between points within states. When motor carriers successfully carry on such business, the question whether the service is convenient and necessary and demanded by the public has been answered in the affirmative. The number of passengers carried runs into the millions per year and one of these carriers has operated as high as 2,000,000 bus-miles per month in the past six months.

### Federal Regulation Needed

Necessity for federal legislation to regulate the passenger-carrying motor vehicle in the interstate field has for a number of years been recognized. There has been, it is true, some difference of opinion as to the form the regulatory measure shall take; but among the representatives of the passenger motor carrier there has been no protest raised to the efforts to induce Congress to act. On the contrary the bus division of the American Automobile Association has consistently labored to co-ordinate the views of the various groups which have from time to time met in conference.

What then is the extent of the necessity for legislation today, it being admitted that legislation is necessary? Federal legislation should certainly go no further than the necessities of the situation warrant; and the requirement of a certificate of convenience and necessity for interstate operation would appear to be the extreme. Bond and insurance protection of the public as a matter of course, follow. Nothing has occurred in my opinion that requires legislation beyond that minimum. Ralph Budd, president of the Great Northern Railway, and whose company through a subsidiary operates one of the largest intrastate motor carriers in Minnesota, said at a meeting in New York this past year:

"The requirement of a certificate of necessity and convenience for interstate operation really seems to be the only pressing necessity for federal legislation."

This undoubtedly was his conclusion as a railroad man, for the Northland company has practically no interstate mileage and is so situated that interstate competition does not affect it.

The best test as to the necessity for specific legislative regulation aside from the need for certificate of convenience and necessity, is probably a determination of the object to be accomplished. The Parker bill covers two additional requirements: rates and schedules.

It will be admitted that both of these are matters of public interest requiring specific regulation if their control is not adequately governed through the hand of the government on the throttle of the regulatory machine—the certificate. It is granted that the authority to issue a certificate embodies the authority to revoke it for cause. Take, then, the question of rates. The passenger motor carrier is the "One and only in captivity"—a public utility where regulatory legislation has been to a considerable extent directed toward restricting it from underselling its established competitor in the commodity offered —transportation.

There then is but slight probability of a present demand for lowering of its service charges—the nature of its competition with the rail carrier will take care of that. It can deliver its form of transportation at a cost not to be met by the rail carrier. Also the private automobile is the leveller of its rates. The industry looks to its natural competitor on the highway—the private car owner—for increase in patronage. To draw this trade the motor bus must convince of its comfort, service and economy.

But assume that the restriction of the field to a single motor carrier on a route might give cause for concern in the matter of excess charges to the public. In addition to these competitive rate regulators, the governor on the operator is the franchise under which he is permitted on the highway. By one gesture toward revocation of this franchise, the regulatory power has the culprit crying for the opportunity to demonstrate his ability to continue in the field. This is no idle figure of speech—control over the certificate is the power to destroy. Furthermore, the mere whisper on the part of the issuing authority that public convenience and necessity were not being served would bring applications for the right to compete on the same route without number. No operator in the field would dare to permit evidence to accumulate that public convenience and necessity were not being reasonably served.

This same club is suspended over the head of the certificate holder in the matter of service. Section 10(b) of the Parker bill was drawn with such warning in mind. It provides:

"That where additional service is necessary or required, the board or commission shall give to the existing motor carrier a reasonable time to furnish said service, etc."

Now on the other hand, what of the necessity for the protection of the rail carrier from competition? If it be conceded that there is "convenience and necessity" for common carrier motor transportation service, then the only thing that should govern the charge for the service

is its cost and not its effect on other forms of transportation. A "form of transportation" may be a regulated monopoly entitled to protection from its kind, but "transportation" in and of itself is not and cannot be a monopoly, any more than "light," "heat" or "power."

We are confronted then with the controversial section five of the Parker bill. Controversial because of the conflict of interest between the agencies on the one hand believing that economic transportation can best be produced by confining the field to the one form, and on the other, this new servant of commerce forcing its economic advantages upon the public in the face of restraint.

There is no other instance in the history of transportation where the beckoning hand of legislative welcome did not invite development — "legislative welcome" because the welcome of the public has been an ovation.

Water, rail and air transportation have each been heralded as forerunners of a greater civilization. And yet it is proposed that the extension of the benefits of the motor carrier—a mode of travel that has revolutionized the world and made the average citizen a master of distance—be made to depend upon the effect it may have upon other forms of transportation, instead of solely upon the benefits to the public. The public is entitled to have written into the law relating to highway transportation, a like declaration of policy as that prescribed for the water and rail agencies, to wit:

> It is hereby declared to be the policy of Congress to promote, encourage and develop highway transportation, service and facilities in connection with the commerce of the United States, and to foster and preserve the same in full vigor.

This was recognized in the report of the Interstate Commerce Commission in Docket No. 18,300:

> The public interest and national welfare are fundamental in legislation affecting transportation, and in the administration of regulatory law. Where there is conflict between public interest and private interest, the former is paramount and the latter must give way.
>
> Railroads have no more economic right to any traffic than had the canals and stage coaches which opposed the constructions of railroads on the ground that they would take traffic already being carried on the canals and highways.

In consideration of the Parker bill before the House Committee on Interstate and Foreign Commerce, there developed a difference of opinion as to the workability of the administrative machinery proposed. Some doubt was voiced as to the constitutionality of delegating authority to issue certificates to the state commissions. The constitutionality question can well be left with Congress in the first instance. What we are all interested in, is the practicability of administration and the preservation of the existing authority in the states.

No state can, nor should, attempt to exercise control over strictly interstate commerce. That is a matter that the constitution lodges in the federal government. The state is interested, however, in the physical operation of the transportation agency within its own borders. A regulatory law should be designed to preserve these prerogatives which the decisions of the courts have determined belong to the state in the absence of federal legislation. This may seem a contradictory proposal, but an examination of the opinions of the Supreme Court in the highway transportation field will disclose the line of demarcation, and indicate that the state jurisdiction is best preserved by confining federal legislation to the narrowest possible limits.

What then is the simplest machinery for certificating operators in interstate commerce? The Parker bill lodges the power in the state boards, or joint state boards. The situation existing in the motor carrier field is not the same today as existed when such administrative machinery was first proposed. Then the transportation of interstate passengers was largely across one state line and at the most two. Today single motor carriers operate through lines from the Pacific to the Atlantic, and from the Lakes to the Gulf. The cumbersomeness of a joint body representing all states exercising administrative duties on applications from coast to coast is apparent.

Application to extend a certificate which has been granted through half a dozen or more states to another state involves the question of interstate commerce in all of them. Are they all to participate in the joint board on such an application? That would be their right and the right of the applicant to have them. The state commission in such a proceeding is called upon to regulate interstate commerce, acting for the country as a whole, while as a representative of the state its interest primarily is confined to the physical operation of the carrier over the state's highways. In attempting by such machinery to preserve to the states the jurisdiction that rightfully belongs to them, they are having thrust upon them control over commerce which constitutionally is lodged in the federal government.

The Interstate Commerce Commission, pursuant to the authority given under paragraph 3 of section 13 of the transportation act of 1920, has adopted rules and regulations under which joint hearings are conducted. The authority given to the states in that enactment may not be adequate to meet the demands of the situations in the highway transportation field, but the basic principle for co-ordination of the regulatory machinery of the federal and state governments is there. It should be expanded. Let legislation clarify the compulsitory clause as to holding joint hearings, let it give to the state representatives sitting in such hearings the dignity of participating in the determinations, but recognize that control of interstate commerce is a federal prerogative and that police control of the highways belongs to the states.

### State Regulation Under Its Police Power

The Supreme Court of the United States has already confirmed in the states numerous regulatory powers over interstate carriers in the absence of federal legislation. Any law passed by Congress should be designed to protect and preserve these constitutional prerogatives of the state. The following principles have been established:

1. Registration of motor vehicles. (Hendrick vs. Maryland, 235 U. S. 610.)
2. Payment of state tax, graduated according to the number and capacity of the vehicles operated. (Clark vs. Commission of Ohio, U. S. Sup. Ct., May 31, 1927.)
3. The interstate carrier is subject to regulation of the state imposed to prevent injury and damage to the highways. (Morris vs. Duby, 47 U. S. Sup. Ct. Rep. 548.)
4. A state may require a certificate of a carrier to carry both interstate and intrastate passengers. (Cannon Ball Transportation Co. vs. P. U. Comm., U. S. Sup. Ct., Interstate Busses Corp. vs. Holyoke St. Ry. Co., U. S. Sup. Ct.)
5. A state may require a non-resident operator to appoint an official of the state for service of process. (Hess vs. Pawloski, 47 U. S. Ct. Rep. 632.)
6. The state may impose upon vehicles using the highways exclusively in interstate commerce nondescriminatory regulation for the purpose of insuring the public safety and convenience; and that a license fee no larger in amount than is reasonably required to defray the expense of administering the regulation may be demanded. (Sprout vs. City of South Bend.)
7. A state may require users of interstate vehicles on the highways to file contracts providing adequate insurance for the payment of judgments recovered for injuries, if limited to damages suffered within the state, by persons other than passengers. (Sprout vs. City of South Bend.)
8. A purely interstate carrier cannot by subterfuge carry on intrastate business. The destination of the passenger when he begins his journey and known to the carrier determines the character of the commerce. (Sprout vs. City of South Bend.)

9. A state may impose upon vehicles engaged exclusively in interstate commerce a reasonable charge as their fair contribution to the cost of constructing and maintaining the public highways. (Sprout vs. City of South Bend.)

It is the common "misunderstanding" that motor buses are using the highways without contributing to their cost or upkeep. Such, of course, is not the fact. Motor buses pay a tax for the use of the highway proportionately in excess of that levied on any other vehicles.

It is a common complaint that motor buses are taxing the capacity of the highways. When an analysis will show that on heavily traveled routes motor buses are in the proportion of one to several thousand other vehicles, that claim is disclosed to be without foundation. Motor buses have made available the use of highways to millions who otherwise would be deprived to a large extent of their benefits. The citizen who does not own an automobile, or who for financial reasons cannot afford to make extensive use of it if he has one, is as much entitled to the pleasure of highway travel as his more opulent neighbor. The car owner who occupies the highway with a vehicle accommodating one or two passengers is not in a position to denounce the user of a vehicle which carries thirty or forty passengers. Bus travel, as a matter of fact, results in economy both of the highways and to the passengers. That is the idea the motor carrier is now engaged in selling.

# Middle Atlantic Equipment Men Discuss New Cars

WITH the spirit that the mechanical department of electric railways should set the pace for other departments to follow, about 30 men of the Association of Electric Railway Equipment Men, Middle Atlantic States, met and discussed various maintenance problems at Hampton, Va., on Nov. 14.



**Middle Atlantic Equipment men attending the Hampton, Va., meeting**

In his opening remarks A. T. Clarke, president of the association, spoke about things that should be incorporated in new cars. Later in the meeting D. E. Frame, master mechanic Delaware Electric Power Company, Wilmington, Del., described interesting details of the new Wilmington cars, which were exhibited at the Cleveland convention and described in ELECTRIC RAILWAY JOURNAL for Sept. 22, 1928. These cars weigh 36,840 lb. without passenger load, are 42 ft. long and seat 44 passengers. They are equipped with four 35-hp. motors. In service average acceleration rates of 3½ m.p.h.p.s. are obtained. In the design of these cars comfort of passengers was given first consideration. The cars have been made as light as possible without sacrificing durability. Particular attention was given to the heating and lighting equipment. Large windows, Flexolith floors and thermostatic control of heaters are features. Variable load brakes give uniform braking with loads of from five to 125 passengers. Drop platforms make necessary only a single step from the street to the inside of the cars, the second pair of steps being made by the passenger after his fare is paid. The units are attracting increased patronage so that they earn more per car-mile than other cars of the company.

Mr. Frame also told of some remodeling which his company is doing to arrange present cars for one-man operation. He expressed the belief that in remodeling cars for city service a maximum weight of 40,000 lb. should be the limit. Cars heavier than that should be considered obsolete.

The dragging of brakeshoes was brought up in the discussion of equipment troubles. The general opinion was that it is better to provide a clearance of about ⅛ in. than to run danger of tight brakes and that piston travel of from 5 in. to 5½ in. could be used successfully. Need for a more satisfactory type of dustguard for journal boxes than is commonly used was considered desirable. The dustguards used in Baltimore were described by Mr. Clarke. These are made of leather and the holes are ⅛ in. less in diameter that the axles over which they fit.

Radio interference from the equipment man's standpoint was discussed. Experience with the new type of General Electric choke coils was mentioned. Other causes for interference that were discussed included arcing at trolley wheels, cutting in and out of compression governors, faulty bonding, sand on the track, inaccuracy in line, electric signals and electric track switches.

There was considerable discussion upon various types of window wipers now used on electric cars. The general feeling of those present was that a more satisfactory device for this purpose than those that are now available is desirable.

Officials of the Virginia Public Service Company acted as hosts at a dinner given to the members of the association at the Hampton Golf and Country Club. An inspection was also made of experimental work being done at Langley Flying Field, and later an inspection was made of the railway company's shops at Hampton. The next meeting of the association will be held at Wilmington, Del., on May 15, 1929.

# MAINTENANCE HELPS That Have Proved

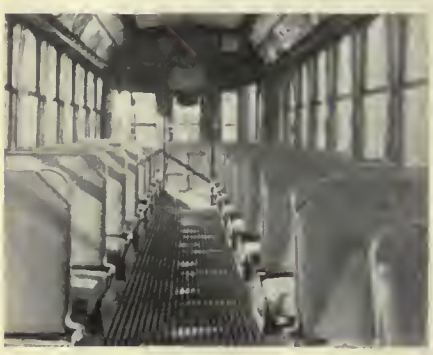
## Cars Improved for One-Man Operation Please Patrons*

By C. B. HALL
*Chief Clerk Mechanical Department Virginia Electric & Power Company, Norfolk, Va.*

CAR remodeling for one-man operation by the Virginia Electric & Power Company, Norfolk, Va., is going forward with marked success. Seventeen cars have been completed so far and placed into regular service. Many favorable comments from pleased patrons have been received. The accompanying illustration shows the interior of the old and remodeled cars.

While the remodeling was undertaken primarily to facilitate one-man operation advantage was taken to introduce numerous improvements. These include such items as new style ventilators, safety-dome type lighting fixtures, sanitary handstraps, side window guards, genuine buffed leather spring cushion seats with aluminum grab handles, rubber tile flooring of block design with brass seam binding, cylinder cross-seat heaters, Staffless brakes, rotary foot gongs, new destination sign curtains and mechanisms carrying 4-in. lettering, door pull plates, operator's window cleaners, wrought steel trap door lifts and special motorman's seats of spring cushion type with padded backs and with cuspidor castings. The numerous changes appeal to the riders much more than the old arrangement with rattan seats.

An appreciable increase in revenue has resulted from the use of these cars in service. Some of the improvements which facilitate passenger movement and so speed up schedules by reducing stops include pneumatic front and rear treadle doors, air brakes and safety car control equipment, Westinghouse type K-75-A controllers with magnetic line switches and knockout cylinders, new side and head lining with Pantasote window curtains. All heater wiring is housed in ½-in. black enameled conduit pipe.





Two views of the Virginia Electric & Power Company car. At left, interior of car before remodeling. At right, one of the new remodeled cars

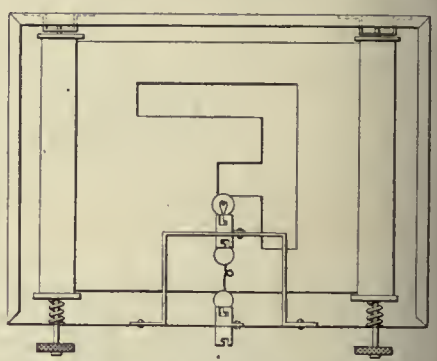
## Geared Control Removed from Destination Sign Boxes*

By FARRELL TIPTON
*Electrician San Diego Electric Railway, San Diego, Cal.*

SEVERAL of the cars operated by the San Diego Electric Railway, San Diego, Cal., came from the factory equipped with a destination sign which was controlled from inside the car. This had an index finger to show the number. Due to wear and lost motion in the gear control it became necessary for the operator to inspect the sign box from the outside of the car in order to see that the sign registered properly, as the index finger did not always show the true position. To eliminate the difficulty without great expense, the geared control was removed and other provisions made for operating the sign.

The accompanying illustrations show the arrangement of the box. It is made of sheet metal, except the front, which is a wooden frame to hold the glass. The back is also of sheet metal and is fastened permanently to the body by brackets. The top and two sides at the back of the box have flanges which slide over and hold it to the back. At the end of each shaft a metal disk is fitted to turn the rollers as desired. A coil spring around each shaft between the bottom of the box and the roller keeps tension on the curtain. Each roller is keyed solidly to the shaft. A bracket is mounted in the center of the box to provide the desired height for the lamps. Two automobile headlight receptacles are used.

*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest.*



Destination sign arrangement used by the San Diego Electric Railway



Appearance of destination sign on one of the cars

Valuable

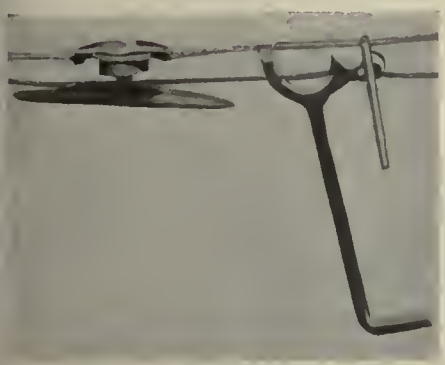
# Tool for Placing Hangers on Span Wire*

By Thomas O. Smith
*Superintendent of Overhead Charleston Interurban Railroad, Charleston, W. Va.*

PLACING span wire insulators on messenger wire or other spans was made a one-man job through the use of a tool constructed in the shops of the Charleston Interurban Railroad, Charleston, W. Va. With this, hangers can be installed by one man at the rate of 100 per eight-hour day. The tool, as shown in the accompanying illustrations, consists of a center clip with two handles shaped so as to hold the hanger and at the same time pull the span wire tight.

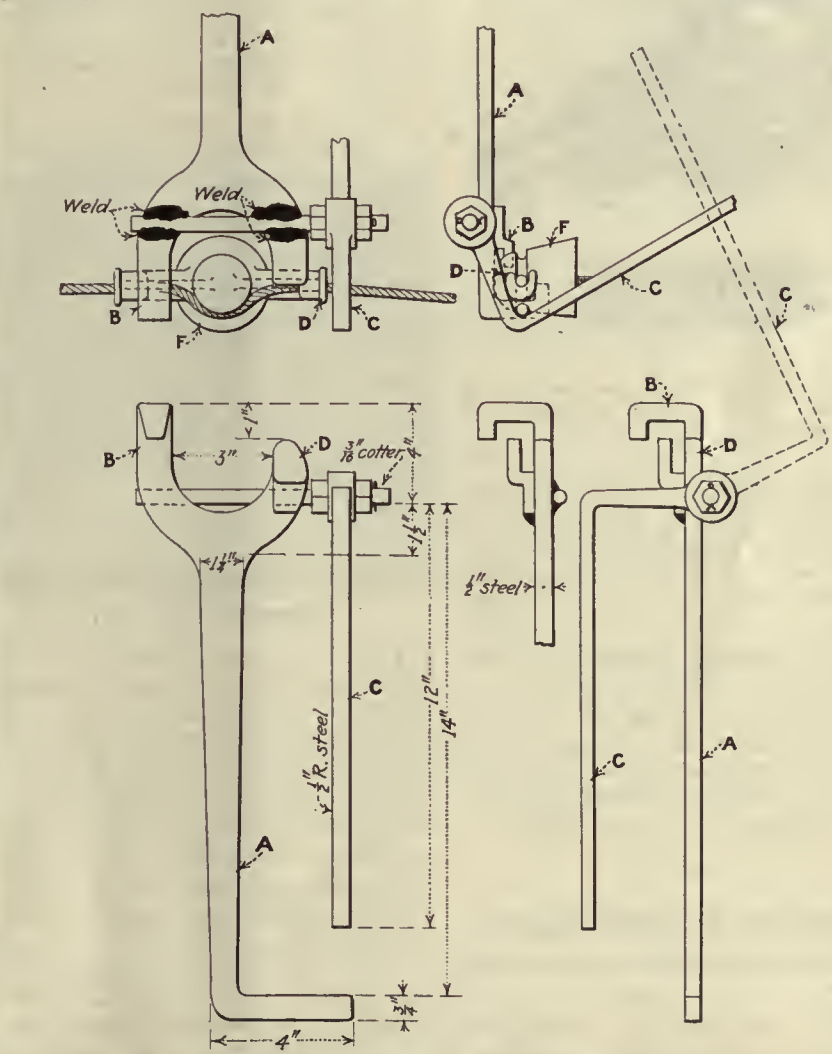
The method of installing a hanger consists of placing the hanger marked *F* in the accompanying line drawing, into the clip *B* while the right hand of the workman holds the handle *A*. The handle *C* of the tool is then placed over the span wire and is drawn closed. This pulls the span wire under the lug *D* on the hanger *F*.

*Submitted in Electric Railway Journal *Prize Contest.*











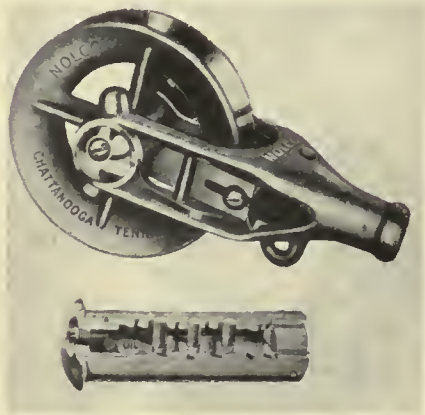



Various stages in the operation of the special tool for placing span hangers on span wire

# NEW EQUIPMENT for Better Maintenance

## Self-Oiling Type of Trolley Harp and Wheel

OIL IS carried in a hardened and ground 1⅛-in. steel axle in the "Nolco" self-oiling non-arcing trolley harp, offered to the industry by the National Oil Lubricating Company, Chattanooga, Tenn. The axle has a reservoir which is filled with oil and




**At top, assembled harp and wheel. At bottom, construction of steel axle with oil reservoir**

this is lifted to the axle bearing surface by three ¼-in. specially treated wood plugs by capillary action. To refill the reservoir a ¼-in. pipe plug is removed from the large end of the axle.

Trolley wheels supplied are made of an alloy of 91 per cent Lake copper, 7 per cent straight tin and 2 per cent horse-head zinc all soft enough to insure minimum wear on the trolley wire, but strong and tough. The harp is made of gun-metal bronze.

## Improved Brake for Cranes

FOR THE bridge drives of electric traveling cranes, lift bridges, electric hoists and other applications requiring foot-operated or hand-lever operated brakes the Electric Controller & Manufacturing Company, Cleveland, Ohio, has brought out an improved type of brake. This is known as type WB, mechanically operated. It is of the shoe type with improved brake and friction linings. The shoes are of unusually thick molded asbestos so that renewal is necessary only after long periods of service.



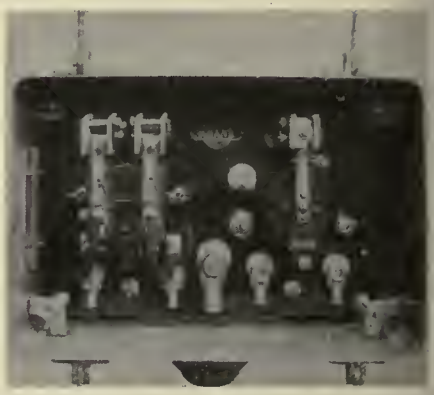
**New mechanically operated brake for cranes**

The tendency toward the use of anti-friction bearings on cranes and other machinery has resulted in an increased amount of work to be performed by the brake. A crane equipped with anti-friction bearings will drift with practically undiminished speed when the controller is shut off. The result is that the brake must stop the crane unaided by bearing friction. This has necessitated improved brake design with increased wearing qualities of the friction linings.

## Field Weakening Device for Tramway Motors

ON ONE of the tram cars in London, a new device has been fitted to weaken the fields of the two driving motors and thus increase the car speed above the normal top value. Field weakening is governed by the current consumption of the motors and not by the speed of the car. Hence, although higher speeds are obtained, overheating and damage to the motors are prevented.

The "Auto Shunt" consists of a double pole contactor switch with powerful magnetic blowouts, mounted on an insulated base with a special controlling relay, and enclosed in a weatherproof housing. The relay has its operating coil in series with the two driving motors. Adjustment is such that when the motor current drops to a suitable value, provided the controller is in the "full parallel" position, the relay causes the contactor switch to close and connect a shunt resistance across the motor fields, whereby the motor is made to take an increased current up to a given limited maximum value. The result is that the motor speed is increased and the car continues to travel at this higher speed until the safe current is exceeded, whereupon the relay opens its contacts and field weakening is discontinued until such time as the lower current value is again reached.



**The "Auto Shunt" weakens the fields of driving motors and increases speed**

## Ventilated Piston Ring for Bus Engines

NEED for a piston ring to serve modern, high-speed bus engines satisfactorily prompted the design of a ventilated ring by the American Hammered Piston Ring Company, Baltimore, Md. As shown in the illustration the new ring is characterized by large closely spaced slots through the center. Above and below these slots are annular grooves. The ring is hammered to establish the tension, so important in an oil control ring.



**Slots through center feature new piston ring**

As these rings have been designed particularly for high-speed engines, there are four scraping edges to remove excess oil from the cylinder walls. The large vents drain the excess oil rapidly because the tension created by the hammering operation holds the scraping edges in firm contact with the cylinder walls at all speeds. While this new ring is designed primarily to remove excess oil, the two annular grooves retain an ample supply of oil for lubrication at high speeds.

# News of the Industry

## Atlantic City in 1929

**Executive committee confirms recommendation that next year's convention be held in Jersey playground's $12,000,000 auditorium**

ATLANTIC CITY is to be the next meeting place of the American Electric Railway Association. The dates are Sept. 28 to Oct. 4, 1929. This the executive committee decided at a meeting on Nov. 23 at which the committee approved the recommendations of the location committee, meeting at association headquarters on Nov. 22. It was the sense of the location committee that the convention open officially Monday morning, instead of on Saturday, and that the convention committee should consider the idea of giving Monday afternoon and Wednesday morning over to an inspection of exhibits. Mr. Dickey, manager of the new Atlantic City auditorium, and Mr. Skene, representing the convention committee of that city, assured the locations committee that the building, now in process of erection, would be completed in time for the installation of exhibits and the holding of the regular meetings of the American and affiliated associations.



Atlantic Foto Service

**$12,000,000 meeting place of A.E.R.A. in 1929**

Mr. Dickey explained that there would be approximately 100,000 sq.ft., net, of exhibit space on the floor of the main auditorium. For the meetings the stage could be shut off from the exhibit hall by a soundproof curtain and there would also be the main ballroom on the balcony floor seating approximately 3,500, a smoking room which would seat 200, and ten rooms, also on the balcony floor, which would seat comfortably about 125 persons each. Buses under their own power could be run up ramps right onto the main exhibit floor. It was proposed to construct tracks on the plaza in front of the building, looking out upon the ocean, for the accommodation of eighteen cars. Tracks arranged on either side of the main building would provide additional space for the car and allied exhibits.

When completed the Atlantic City auditorium will be the largest and finest building of its kind in the world. It will cost, completely equipped, about $12,000,000. The main auditorium presents a vista from end to end unbroken by columns or supports, with its main spans 350 ft. in width and at an elevation of 130 ft. above the floor. Decoration will be lavish but tasteful. This last feature is advanced as being of some importance in that it will not be necessary for the association to expend any money for decorations. The grand ballroom promises to be one of the most magnificent public rooms in the world. It is located on the balcony level at the end of the building nearest the ocean, and will open onto a superb loggia overlooking the plaza and the ocean.

## Another Use of Weekly Pass on Pacific Electric

Further experimenting and use of the card pass form of ticket on lines of the Pacific Electric Railway, Los Angeles, Cal., was recently announced with a new form of weekly pass. To be tried out exclusively on the railway's lines to Redondo Beach and points en route the $2.75 weekly pass became effective on Oct. 28. This weekly pass supersedes the former monthly pass sold previously on the Redondo Beach lines at a $13 monthly rate and referred to in the JOURNAL of Aug. 11, 1928.

Like the monthly pass, the new weekly pass is transferable and may be used at the option of the holder as frequently as possible during the seven-day period for which its use is prescribed. The new pass becomes effective on Sunday of each week and is good to and including the following Saturday. It also carries the provision of the monthly pass in that it may be used on all local cars of the Pacific Electric within the first zone in Los Angeles.

Decision to try out the weekly form of pass was due to the fact that numerous persons received their pay checks each week and requested that the weekly form be tried out to determine its popularity with patrons.

## New York Drafts Plans to Run Its Subways

Plans for the operation of the major part of the Manhattan lines of the new city subway system in New York to begin early in 1930, have been announced by the Board of Transportation. Provisions for passenger transfer facilities with lines of the Brooklyn-Manhattan Transit Corporation and the Interborough Rapid Transit Company at seven points in Manhattan reflect the influence of the unification negotiations now pending with the B.-M. T. and take into consideration also possible recapture of I. R. T. lines.

Negotiations for power supply have reached almost their final stage, after a long series of conferences among engineers of the Board of Transportation and representatives of the New York Edison Company, the United Electric Light & Power Company, the B.-M. T. and the I. R. T. The board has definitely abandoned any intention of building its own power plants.

The city plans to begin operation with express service from 207th Street and Fort Washington Avenue to a temporary terminal at Church and Chambers Streets, and a local service from Broadway and 168th Street to the same temporary terminal. The Manhattan section of the new city system will run along the west side from Fulton Street to 211th Street and Fort Washington Avenue, linking with the line to Queens.

Of the seven connections with existing lines, four will be with the B.-M. T. Interchange of passengers will be possible by means of underground passageways. In the event of unification or recapture, transfers would be permitted, according to present plans. The 300 modern steel cars already ordered for use on the city's own system can be operated on the B.-M. T. The system has been so designed, furthermore, that actual physical connection with the B.-M. T. can be established for interchange of traffic. Similar connections with the I. R. T. would require extensive alterations in I. R. T. platform widths and in other details.

## Situation in Akron Clarified

The City Council of Akron, Ohio, has adopted a temporary franchise for the Northern Ohio Power & Light Company to cover the emergency until such time as a permanent franchise can be agreed upon. The railway and bus franchise, approved four years ago by an overwhelming vote of the people of Akron, has expired. On this subject of a franchise A. C. Blinn, vice-president and general manager, made this statement on Nov. 6:

The company is ready and anxious to enter into negotiations for a new transportation franchise at any time. We believe the question should be settled as early as possible in the coming year particularly because of the very large expenditures the company will be called upon to make in the summer of 1929 to keep pace with street improvements and city expansion. Two major projects are the laying of 8,000 ft. of double track on East Exchange Street and 7,000 ft. of double track on South Arlington Street. In addition to those two items, other work to be done will bring the total capital outlay up to $700,000. This work should be started as early in the spring as weather will permit.

The report of the fact finding committee will, so we are informed, be completed in a very short time, probably within the course of ten days or two weeks and negotiations could be started immediately after the report is submitted to the City Council.

As repeatedly stated heretofore, our company desires to co-operate in every way possible in providing the people of Akron with an adequate transportation service. As the city grows the question becomes of greater importance and we haven't the slightest doubt but a contract can be worked out to the complete satisfaction of both the public and ourselves and this without any unnecessary delay.

The city is entering a new area and as many of these public questions as we can dispose of now, the better able we will all be to go forward with other big things for Akron.

Car and bus lines in Akron form a complete network in and about the city. One of the biggest problems now up for settlement covers the matter of traffic. The company feels that demands are certain to become heavier on the transportation system. A committee of citizens undertook several months ago to make a thorough investigation of the company's system and study future needs and requirements. This report has not yet been presented.

## Another Step in Wage Case in St. Louis

Briefs have been filed by both sides in the wage dispute between the St. Louis Public Service Company, St. Louis, Mo., and its union carmen and shop workers. The Missouri Public Service Commission has agreed to arbitrate the case. The carmen are asking an increase of 5 cents an hour, increase in number of straight runs, time and half for all overtime and increase in minimum allowance for extra men. Increases for all the non-transportation workers and a reduction in their hour of labor is also asked. The company contends it cannot afford to pay the increase asked.

## Supreme Court Denies Jurisdiction in Baltimore Case

The United States Supreme Court on Nov. 19 dismissed for want of jurisdiction appeals by both the United Railways & Electric Company, Baltimore, Md., seeking a 10-cent fare, and by the Maryland Public Service Commission, opposing a 10-cent fare, and a Maryland Court of Appeals decision allowing the company a depreciation credit on valuation on the basis of "present value" of property. The appeals were dismissed because no final judgment had been reached in the cases in the lower courts.

Both the United Railways and the Public Service Commission have sought to get the case before the United States Supreme Court since a decision was handed down by the Maryland Court of Appeals some months ago. In that decision the Maryland court reversed a decision given earlier by Judge Joseph N. Ulman, who held that the rate of return possible under the three-fares-for-a-quarter plan approved by the Public Service Commission was confiscatory. The Court of Appeals held that it was not confiscatory.

The United Railways sought a review of this. The Court of Appeals held that the Public Service Commission had erred in fixing the depreciation allowance to the company on the basis of the cost to the company of the property depreciated. It held that this allowance should be based on the replacement cost; what it would cost the company to replace the property at the present time.

The Public Service Commission sought a review of this element of the case. The decision of the Supreme Court is a refusal to hear the claims of either party.

In the new hearing to settle the depreciation point, H. Carl Wolf, chief engineer of the commission, suggested an increase in the depreciation allowance from $880,000, which was set by the commission in the first hearing, to $1,687,000. In fixing the new figure Mr. Wolf explained that he reached this amount by means of a physical inspection of the company's depreciable property.

On the other hand, Charles Nodder, chief accountant for the commission, favored an annual depreciation allowance of $1,269,000. The United, however, claims a fair amount would be $2,200,000. The commission now has the three amounts with which to deal.

### COMING MEETINGS OF *Electric Railway and Allied Associations*

***Dec. 7*** — **Metropolitan Section, American Electric Railway Association and Metropolitan Section, Society of Automotive Engineers, joint meeting, 33 W. 39th St., New York, N. Y.**

***Dec. 10*—National Highway Traffic Association, annual meeting, Automobile Club of America, New York, N. Y.**

***Jan. 14-18, 1929*—American Road Builders' Association, convention and road show, Cleveland, Ohio.**

***Jan. 22*—New York Electric Railway Association, mid-winter meeting and dinner, Hotel Commodore, New York, N. Y.**

***Jan. 23-25, 1929*—Electric Railway Association of Equipment Men, Southern Properties, and Southwestern Public Service Association, Mechanical Division, joint meeting, Houston, Tex.**

***Jan. 24-25*—Central Electric Railway Association, Claypool Hotel, Indianapolis, Ind.**

***Jan. 25-26*—Central Electric Railway Accountants' Association, Claypool Hotel, Indianapolis, Ind.**

***Jan. 28-Feb. 1*—American Institute of Electrical Engineers, annual convention, 33 W. 39th St., New York, N. Y.**

***Feb. 14*—Central Electric Railway Master Mechanics' Association, Youngstown, Ohio.**

## Messrs. McIlraith, Gould and McClintock on Program

Members of the National Highway Traffic Association will hold their Tenth Annual Meeting at the Automobile Club of America in New York City on Dec. 10, 11 and 12. An interesting program has been outlined, which includes the following addresses: "Economic Utilization of Highways," by George H. Pride, Pride Transportation Company; "The Necessity of Research in the Solution of Traffic Control Problems," by H. M. Gould, Consulting Transportation Engineer of Detroit, and "Problems of Efficient Street Use by Vehicles and Pedestrians," by Dr. Miller McClintock, Director of the Erskine Bureau of Street Traffic Research, Harvard University.

Eighteen national committees will present reports at the meeting. Among these are: "Effects and Regulation of Overloading and Overspeeding of Trucks and Buses," to be presented by D. C. Fenner, Public Works Department, International Motor Company; "Safety Code for Brakes and Brake Testing," by H. H. Allen, Bureau of Standards, United States Department of Commerce; "Traffic Control on Car Tracks Adjacent to Safety Zones," by E. J. McIlraith, staff engineer Chicago Surface Lines; "Municipal Organization for Solution of Traffic Control Problems and Formulation of Regulations," by T. Fitzgerald, vice-president Pittsburgh Railways; "Terminology of Traffic Control," by Harold S. Buttenheim, Editor the *American City Magazine*, and "Parking Regulations," by Prof. Roger L. Morrison, University of Michigan.

# Ten Cents Sought in Kansas City

## Company enumerates reasons for necessity of higher fare. Does not countenance trunk line buses. Decline in traffic alluded to by President Groner

A REPORT setting forth the necessity of a 10-cent fare in Kansas City, Mo., has been submitted by the Kansas City Public Service Company. The report was given to the City Council on Nov. 19, and the Council received and filed the document, indicating that since the report was merely an informative article, the Council would take no action on it at this time. In the form of a 52-page document prepared by Powell C. Groner, president of the company, the statement submits that a 10-cent fare is necessary in order to improve the service, provide employees' pensions, and a wage advance, and eliminate the threat of a receivership.

A proposal to couple three tokens for 25 cents with a basic 10-cent fare was opposed. The company believes that a combination of this kind would be utterly inadequate to apply on the program and pay preferred stock dividends.

It states that the continuance of trunk line buses is an economic mistake, although continuance of bus service with new equipment is promised if the fare increase is made. Bus operations according to the report have resulted in a loss of approximately $280,000 a year, this deficit necessarily being made up from the revenue derived from railway riders. This is a heavy tax on the transportation system as a whole to provide bus service for only 3 per cent of the total passengers. It is said that the seeming public demand for such service was not real if bus patronage can be used as an index, and that apparently such a duplication of transportation facilities at so great a cost is an economic mistake and that the buses would perhaps serve a better purpose if used only for feeders and to supply transportation where none now exists.

The suggested remedy of a return to lower fares is met with a statement that it would require 165,000,000 revenue-passengers at 5 cents to meet the present cost of service, whereas at the peak of riding in 1922 the company had only 136,000,000 passengers.

Service improvements urged at this time are estimated at $835,000. Economies anticipated from the rehabilitation of the system and the complete adoption of one-man operation brought a cut in operating expenses in 1928 of $930,000 under the expenses of 1926. However, with the decline in traffic showing only slight abatement the company warns that it has reached the limit of its ability to effect further operating economies.

Last year the company lacked $453,421 of earning the permissible return of $2,065,110 and in nine months this year has fallen $455,466 short of earning as much as the franchise would permit.

According to Mr. Groner an ordinance for an increase in fare will not be submitted until the public has been acquainted with the facts.

In discussing the decline in street car riding Mr. Groner attributes it to the following four causes:

The 59 per cent increase in motor cars in Jackson and Wyandotte counties since 1922, every new car on Kansas City streets generally meaning at least two fares a day less for the company.

The growth of outlying community business centers, bringing a decrease in shopping or non-rush hour riding.

The radio and outlying theaters cutting night riding.

Traffic congestion, slowing up service.

Elimination of parking, increase in arterial streets, clearing of motor cars from street car tracks and the reduction of the number of street car stops to about seven a mile are listed as methods to speed up service as much as 20 per cent. The Councilmen with the exception of two stated they were opposed to the fare increase.

## New York Case Must Be Reargued on Jan. 14

In an order read from the bench on Nov. 19 by Chief Justice Taft, the United States Supreme Court directed a reargument on Jan. 14 next of the case by which the city of New York seeks to prevent the Interborough Rapid Transit Company from increasing the 5-cent fare to 7 cents.

There is an intimation that the present record is too voluminous and that the new one must be curtailed. The court bluntly stated that the new briefs "shall be compact, logically arranged with proper headings, concise and free from burdensome, irrelevant and immaterial matter."

The text of the order follows:

159 Gilchrist, et al., vs. Interborough Rapid Transit Company.

This case is ordered to be restored to the docket for reargument on Jan. 14, 1929.

The same limitations as to the time of argument and the number of counsel as in the original hearing shall apply. It is directed by the court that new briefs shall be filed complete, and that the old briefs heretofore filed shall not be used.

The new briefs shall be compact, logically arranged with proper headings, concise, and free from burdensome, irrelevant and immaterial matter. The appellants shall prepare and file their briefs on or before Dec. 17, 1928.

The appellees shall prepare and file their briefs on or before Jan. 2, 1929, and the appellants shall file reply briefs by Jan. 9.

As a rule, the court directs that a case be reargued only where the court regards a pending record as too voluminous for consideration. In the Interborough case, now pending on appeal from the decree of the statutory court prescribing a 7-cent fare, sixteen briefs, numbering about 2,700 pages and containing about 878,000 words, were filed. This apparently was too much for the court and led to the issuance of the order read by Chief Justice Taft.

The 7-cent fare litigation began on Feb. 1 last, when the company filed its petition with the Transit Commission, and followed this action by filing suit in the United States district court two weeks later. According to the company's counsel the 7-cent fare, although suspended, has been the legal fare on its subway and elevated lines since March 3 last. On this basis the company estimates that it will have lost millions in uncollected fares during the pendency of the case should the ultimate decision be in its favor.

One effect of the order made by the Supreme Court on Nov. 19 will be a drastic reduction in the size and volume of the new briefs as compared with those filed in October.

## Out of a Clear Sky

WELL, it was high time something was done about lawyers' English.

It would be a lot more fun for the judges, for the court attendants, for the reporters and for the general public if the lawyers hired writers to do their important briefs. One wishes there had been some way whereby the United States Supreme Court, instead of sending the tangled mass of verbiage in the subway fare case back to the lawyers who had caused the tangle, could have assigned the revision of the briefs to Ring Lardner. A brief on the subway rate increase by Ring Lardner would be more fun than a brief on the same subject by Charlie Craig or Sam Untermyer. Mark Twain should have written the Dred Scott decision, and what Elinor Glyn could have done with the briefs in the famous Danbury hat case is nobody's business.—Frank Sullivan in the New York *World*.

## Way and Structures No. 5

Outlining work to be undertaken and the appointment of sub-committees occupied the attention of members of way and structures committee No. 5 on wood preservation at a meeting held at association headquarters, New York City, on Nov. 19. Those present were C. A. Smith, chairman, A. B. Campbell, M. J. Curtin, Chester F. Gailor, Ernest F. Hartman, Leo P. Scanlan, F. H. Swayze, H. J. Lucey representing B. Kuckuck, and George McCaskey representing J. S. Ware.

## Illinois Rate Advance Extended

The Illinois Commerce Commission on Nov. 17, extended to May 24, 1929, the proposed advances in rates for street car and bus service sought by the Illinois Power & Light Company. Services in Bloomington, Normal, Danville, Quincy, Galesburg, East Galesburg, Champaign, Urbana, Decatur, Jacksonville and East Jacksonville will be affected.

## Michigan Towns to Vote on Franchise

Granting of a 30-year franchise to the Detroit United Railway to operate its interurban cars in Troy and Avon townships is to be voted upon in the two townships at a special election to be held on Dec. 1. Although the proposition has been rejected by the voters at Clawson and Royal Oak it is expected that a favorable vote will be given in both the Rochester townships.

## Suburban Long Island's Transit Needs Urged

Daniel L. Turner, transportation expert, was the speaker at the annual luncheon of the Long Island Chamber of Commerce, held at the Hotel Pennsylvania, on Nov. 21. He dealt with the transit needs of that portion of Long Island which lies within the area of the Suburban Transit Engineering Board, established jointly by the North Jersey Transit Commission and the Port of New York Authority to study and recommend a solution of the traffic problem as it affects the area which lies outside the limits of the greater city and within a radius of 40 miles of City Hall.

This territory now includes the townships of Babylon and Huntington in Suffolk County, the whole of Nassau County and that part of Queens County beyond the border of Queens Borough. He said this area is being dealt with as a unit by a sub-committee of the board, as are likewise the two other suburban sectors comprising, on the one hand, Westchester and Connecticut, and on the other, North Jersey and Rockland County.

## Commuters Oppose Postponed Advance by Aurora & Elgin Case

A petition was filed with the Illinois Commerce Commission on Nov. 14 by the Commuters' Protective League, asking for the appointment of an auditor to go over the books of the Chicago, Aurora & Elgin Railroad to determine if a proposed increase of 20 per cent in commutation fares between Chicago and western suburbs is justified. The League is a group of west suburban residents organized recently to oppose the railroads' application for higher fares. It charges that an additional fare increase will hamper the growth of their communities and restrict travel to and from Chicago. According to Secretary Brown of the organization the request for an increase in rates is regarded by that body as unreasonable.

Final hearing of the case has been postponed until Nov. 28 at the request of attorneys for the Commuters' League. In opposing the postponement of the hearing, counsel for the company asserted that the delay in hearing the case was costing the railroad $10,000 a month, providing the application is finally approved.



Edward J. Mehren

## McGraw-Hill Expands in Middle West

**Four McGraw-Hill papers now published in Western metropolis. Fifth soon to move to Chicago. Edward J. Mehren resident executive**

SIGNALIZING the rapid development of its publishing operations, the McGraw-Hill Publishing Company, publisher of ELECTRIC RAILWAY JOURNAL, is having erected for it in Chicago a building to bear its name and for the first time is placing there a resident vice-president as head of its Chicago interests. The building is now in course of erection at 520 North Michigan Avenue, two blocks north of the Wrigley Building in a rapidly developing new business center and will house all the McGraw-Hill interests centering in Chicago. The resident vice-president will be Edward J. Mehren, a native Chicagoan, who has been with McGraw-Hill in New York for 22 years in editorial and publishing capacities.



New home of McGraw-Hill in Chicago

These two moves are a logical result of the rapid expansion of the company's activities in Chicago. It now publishes there four papers, *The Magazine of Business, Factory and Industrial Management, System,* and *Harvard Business Review,* the last issued for the Harvard University School of Business Administration. A fifth magazine, *Industrial Engineering,* will shortly be transferred from New York to Chicago.

These developments have long been planned by the company. For 25 years it has maintained in Chicago large editorial, sales and circulation staffs, in intimate contact with those who have been making engineering and industrial history in that territory. This has impressed on the organization the great engineering and industrial strides of the Middle West and its still greater potentialities. To be more intimately a part of that development, present and forthcoming, the company had long planned to publish part of its group of papers there, and having accomplished this purpose, now signalizes its establishment of a great publishing house in Chicago by taking its own building and establishing there a resident vice-president. More than 400 employees are now attached to the Chicago office.

Edward J. Mehren, the resident vice-president, was born in Chicago and educated at the University of Illinois. After a short period of service in the civil engineering corps of the Burlington and the St. Paul railroads, he became associate editor of *Engineering Record,* and in succession, editor of that paper, editor of *Engineering News-Record,* vice-president in charge of publication of four of the company's magazines, and, finally, vice-president and editorial director, in charge of editorial work of all its properties. Recently, he was appointed editor of *The Magazine of Business.* He will continue that responsibility as well as the resident vice-presidency.

James H. McGraw, chairman of the board of the company, commented on these developments as follows:

> The publishing interests of the country have long been aware of the advantages of location near the center of population and industry. These have been advancing steadily westward. The inevitable conclusion is that a house of national interests, particularly when it has a number of papers, should strengthen its position by decentralizing its operations and should not concentrate its forces in one center.
>
> This step constitutes another forward movement in the steady growth in the McGraw-Hill organization as an effective institution for serving American industry and business. It marks the realization of my hope of many years that the company should have a strong publishing house in the Middle West, at a second major radiating point, giving practical expression through the various channels of its activities, of the service opportunities and ideals of the McGraw-Hill company. The organization has always been national and international in thought and purpose. Now it takes another step forward in the physical expression of its aspirations and of the policies expressed in its papers.

## Charges Growing Out of New York Accident Dismissed

The last official investigation into the Times Square subway wreck of Aug. 24 closed on Nov. 19 with the dismissal of charges against Harry C. King, towerman. King's case went to jury on Nov. 16. On Monday that body filed with Judge Mancuso a dismissal of the charges against him. He had been held for second degree manslaughter after a hearing in Homicide Court before Justice Corrigan.

The accident cost eighteen lives and occasioned injury to more than 100. The Transit Commission expressed the opinion that the wreck was due to "man failure," but William S. Baldwin, maintenance foreman, had the charges against him dismissed in the Homicide Court hearing which held Mr. King. The action of the jury on Nov. 19 apparently ends the attempt to place the blame for "man failure" on anyone.

Mr. King, a train clerk who occasionally acted as towerman, had been charged by the District Attorney with actuating the devices in the tower which sent the last cars of the heavily loaded south-bound express train hurtling through an open switch and caused one of them to be sliced in half against a concrete pillar.

## Another Rapid Transit Act to Be Discussed in St. Louis

The terms of a rapid transit enabling act for St. Louis, Mo., to be introduced when the Missouri Legislature convenes at Jefferson City on Jan. 2, next, will be discussed at the next meeting of the Transportation Survey Commission of the city. Copies of the enabling act of 1927, which failed of passage, have been printed and sent to each member of the commission for consideration. The members have been asked to make a study of the measure and determine how it can be improved.

The last enabling act died in committee because of the opposition of downtown property owners who objected to a clause which provided that the rapid transit improvements should be paid "in whole or in part" by special assessments against property in the areas served by the system.

## Renews Request for Increase in St. Paul

With the petition by the Minneapolis Street Railway, Minneapolis, Minn., for an increase in the rate of fare, renewal of the request for an increase was made by the St. Paul City Railway, St. Paul, Minn., and an added petition was for increase in rates for Stillwater and Bayport, which are on a suburban line operated out of St. Paul. A brief cited that the Minnesota Railroad & Warehouse Commission had postponed a hearing on this previous request for St. Paul five times and since the last continuance has failed to set a date for the hearing. In the case of the St. Paul City Railway the company claims a value of at least $16,608,543, as of Jan. 1, 1928, and states it has earned only 2.53 per cent on this valuation the first nine months of the year.

In the case of the Minneapolis company the brief states that while the commission on July 3, 1925, fixed its property valuation as of Jan. 1, 1925, at $26,787,228 the valuation as of Jan. 1, 1928, is at least $27,492,729, a figure arrived at by adding the cost of additions since 1925. On the company's valuation basis the return is estimated at only 4.15 per cent, whereas the commission had set 7½ per cent as a reasonable return.

## Taxis a Menace in Massachusetts

The Springfield Street Railway objected to the coming to that city of a taxi company which proposed to charge 50 cents to any part of the city, when the Transportation Board of Springfield, Mass., held a hearing recently on the subject. Under a schedule of this kind the railway contended it would be possible to fill up spare taxis at factories and thereby cut heavily into the revenue of the railway.

In Worcester the Consolidated Street Railway is confronted with the competition of taxis that operate under a flat rate of 35 cents in the city limits. The flat rate started a taxi war, but eventually all the concerns came to an agreement to maintain that rate. The railway has not felt this form of competition to anything like the alarming degree that was anticipated at first.

## Time for All Things

PHILADELPHIA RAPID TRANSIT has wisely determined to make necessary track changes in the downtown district hereafter only during the night hours. This practice will make for the greater convenience of the public and reduce the source of traffic delays and congestion. It will be adhered to except in cases of emergency.

In this policy the company should have the practical cooperation of the municipality. There is already in operation a system of co-ordinated effort in the matter of paving repairs on streets occupied by trolley tracks, but the plan might profitably be extended to many other forms of public work involving the opening of streets. Night work, however, promises to be the most effective contribution toward the speeding up of traffic, for, even though the initial cost may be greater, the saving resulting from the reduction in the number of interruptions by traffic should nearly if not quite equalize the cost factor.—*Public Ledger.*

## One-Man Car Rights Refused in Oakland

Permission to operate one-man cars over four lines has been refused the Key System Transit Company by the Oakland City Council by a margin of one vote. Mayor John L. Davie voted against the one-man cars and his protest was sufficient to prevent a Council majority in their support. Frank Colbourn, commissioner of public works, who moved to grant permission for their operation, and Charles C. Young, commissioner of public health and safety, voted in favor of the measure.

The four lines involved have been operated under one-man service continously for eight years, part of that time contrary to terms of a city ordinance which forbade one-man car operation in the city of Oakland.

The 90th Avenue, Fruitvale Avenue and 23rd Avenue lines have been operated with one-man cars since 1920, while the Cemetery line at the head of Piedmont Avenue has operated under one-man service since 1903.

No letters of protest against granting permits for the four lines had been filed, according to City Clerk Frank C. Merritt.

## A Gesture Which Won Good Publicity in Portland

The Portland Electric Power Company, Portland, Ore., gave free rides recently to the Pacific International Livestock Show to all passengers from the steamer *Malolo*. The landing of this steamer in Portland Harbor was a memorable occasion. It was the first large ship to carry passengers direct from Portland to Hawaii. The vessel was the show place in the city while it remained, and all passengers were highly fêted, being taken for drives and entertained socially.

The steamer landed during the week of a stock show which was attracting thousands, and the rides offered by the Portland company were a courteous gesture much appreciated.

## New Subway Plan Advanced for Detroit

Plans for a subway system for Detroit, Mich., are to be submitted at the spring election if the Mayor and the Council approve, says Colonel Waldon, chairman Rapid Transit Commission. The financial plan advanced previously has been revised so that yearly costs will be provided for by bond issue.

Since the new plan has been advanced Councilman Littlefield has announced that he will oppose the Transit Commission's plans for the subway system, and advocate subway dips for street cars downtown. Colonel Waldon, chairman of commission, declares Mr. Littlefield's scheme would not give sufficient relief and tunnels could not be used later as part of the subway system.

# Foreign News

## New Law in England Curbs Bus Competition

By a vote of 192 against 118, the English House of Commons, passed the second reading of the Nottinghamshire & Derbyshire Tramways trolleys vehicles bill recently. This bill, which was promoted by the tramway, grants a virtual monopoly on the routes operated. The bill provides that so long as the tramway furnishes a service of tramways or trolley buses which adequately meets requirements, it shall be unlawful for any other company or any local authority to run buses along the company's routes in competition with the company. It is also provided that existing bus services are not to be interfered with and that the Minister of Transport is to determine any question arising as to adequate service or competition.

Labor members of Parliament opposed the bill on the ground that it would establish a monopoly detrimental to the public interest. Colonel Ashley, the Minister of Transport, in supporting the bill, pointed out that apart from London the principle of limitation already exists in Oxford and in a bill now passing through Parliament relating to Greenock. In both these instances the privilege was granted to companies, and the same principle should apply to companies as municipalities; that is, the reduction of wasteful competition by restriction of bus services.

## Dublin-Lucan Line Reopened

After having been out of operation for a number of years, the street car line running from Dublin to Lucan, Ireland, has been reopened. This line is approximately 9 miles in length and has two competing bus lines.

## Tramway Offices Burned

The building occupied as the offices of Salford Corporation Tramways in England was destroyed by fire recently. The basement of the premises was occupied as a wall-paper warehouse and the fire originated there. Many of the records of the tramway department as well as 20,000,000 tickets were lost.

Salford, though a separate borough, is really one city with Manchester in regard to continuity of buildings and streets, and the Manchester tramway department came to the help of Salford and thus prevented tramway traffic arrangements from being disorganized. Tickets were also borrowed from Bury Town Council and the South Lancashire Tramways with which as with Manchester, Salford has inter-running agreements. A new supply was also ordered and delivery began on the following day. To accommodate the tramway office staff the social room of one of the tramway depots was converted into a temporary office and some other municipal offices were utilized.

## Argentine Contracts for Great Britain

Contracts have been placed by the Central Argentine Railway with the Metropolitan Carriage Wagon & Finance Company, Birmingham, for the supply of 30 motor bogie first-class coaches and with Cammell, Laird & Company, Nottingham, for thirteen first-class trailer coaches and six second-class trailer coaches. These coaches are for use on the electrified lines around Buenos Aires, Argentina.

## Progress in Paris Electrification

Electrification of the steam line connecting Paris, Saint Lazare and Versailles is nearing completion. This work marks an important step in the development of electric lines serving some of the more distant suburbs of Paris, bringing the total electrified mileage operated by the Chemins de Fer de l'Etat to 56 miles and the total daily number of electric train-miles to 9,321.

Four groups of trains will be operated on the new line to Versailles; the first group will provide a local service between Paris and Becon-les-Bruyeres over a distance of 4 miles from Paris; a second group will provide non-stop service to Becon-les-Bruyeres, and local service between that point and Versailles; the third group will provide non-stop service between Paris and Saint Cloud and local service therefrom; the forth group will provide a non-stop service between Paris and Versailles direct.

## Street Railway Operation in Zurich

Twenty-one routes, representing 68 miles of track, are now served by the Zurich municipal tramway, Zurich, Switzerland, according to the annual report sent out by the director. This is an increase of 1¾ miles over 1926.

The figures show:

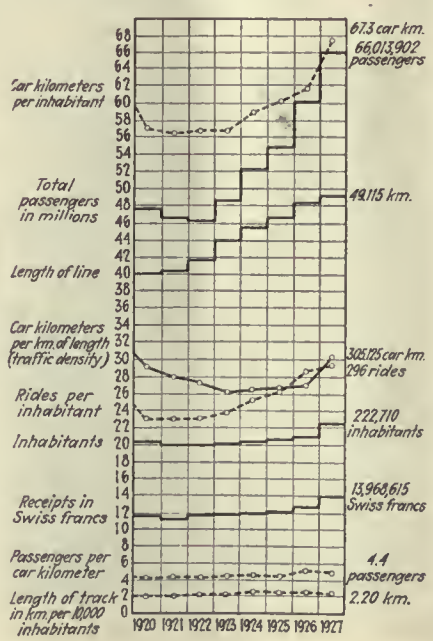
| | 1927 | 1926 |
|---|---|---|
| Car-miles operated | 9,366,401 | 8,137,196 |
| Passengers carried | 66,013,902 | 60,350,836 |
| Total revenue | $2,793,723 | $2,608,039 |
| Total operating expense | $2,273,909 | $2,072,975 |

The rolling stock equipment at the end of 1927 consisted of 203 motor cars and 157 trailers, a number of old motor-equipped cars having been converted to trailers. Of the latter 98 are now fitted with electro-magnetic brakes.

The quantity of energy consumed by the six transformer stations supplying the tramway system advanced from 11,761,720 to 13,463,815 kw.-hr. The number of officials and workers employed in connection with the tramways increased from 1,241 in 1926 to 1,344 last year; the last mentioned number includes 304 drivers and 570 conductors.

The report adds that the municipal authorities have voted a sum of $524,000 for the construction of two large carhouses and that considerable discussion took place on a proposal to adopt four-axle cars. Eventually this matter was referred to a committee and as the result of its report an order has been placed for twelve new two-axle cars, each axle being fitted with a 76-hp. motor working at 600 volts.

The accompanying chart gives a number of interesting comparisons of operation which cover a period of about eight years.




## Meeting Bus Competition

In order to combat competition by buses, the London & Northeastern Railway is now issuing return tickets at single fare on their electrified lines in the northeast of England.

## Ecuador Railway Sold

The Empresa Electrica del Ecuador, controlled by the Electric Bond & Share Company of New York, has sold its local street railway, Tranvias de Guayaquil, to Rodolfo Baquerizo Moreno. It is understood that 50,000 sucres ($10,000), was paid for real property rights, such as rails and rights-of-way; and 200,000 sucres ($40,000) for cars and other equipment. The operations of this line will be extended and it is expected that an increase in fare from $0.01 to $0.02 (U. S. currency) will be granted by the municipal government.

# Recent Bus Developments

## Competitive Plan Rejected

**Los Angeles board turns down plea for franchise for 5-cent line to compete with Los Angeles Railway**

NO GRANT for the operation of a bus line with a 5-cent fare over streets used by the Los Angeles Railway, Los Angeles, Cal., can legally be granted to Charles A. Palmer, who made the application, according to information furnished to the Board of Utilities. A report against the plan was adopted.

Mr. Palmer is president of the Comanche Mining & Reduction Company. He had sent a communication to the Mayor proposing the bus line as a rival to the railway service because of the increased fare. He explained that if granted a franchise he would organize a company to establish the bus service. The proposal was passed to the City Council, which passed it to the utilities body. Mr. Palmer asked for a twenty-year franchise.

Deputy City Attorney James Ronald presented an opinion that there was nothing to act upon, as the proposed bus concern had not been organized and everything appeared contingent on the possible granting of the franchise. In addition, the board was without power to grant other than a yearly permit with possibilities of annual renewal, which would not make a twenty-year franchise on which to organize a bus company.

Report of General Manager Marsh of the Board of Public Utilities and Chief Motor Vehicle Inspector Gunn to the board, in part, follows:

In analyzing the communication of Mr. Palmer it would appear that this is not an application for a bus franchise, but is a statement that if the Los Angeles City Council will grant him a twenty-year franchise he will proceed to organize a bus company.

In checking over Ordinance No. 58198, the ordinance regulating the operation of buses over streets of the city, we find:

"It shall be unlawful for any person to operate or cause to be operated, any bus owned or controlled by him for transportation on any street in Los Angeles without first having obtained a permit in writing from the board to do so."

The balance of the section provides how application shall be filed and the procedure to be followed.

Section 5 provides that no bus shall be operated within a certain restricted area which might be defined as Main, Spring, Broadway, between First and Eighth Streets.

From all of the above it would appear that no long-term franchise can be granted by the Council or Board of Public Utilities. It also would appear that there is a certain area in which bus operation is not permitted and if a bus company was to parallel the lines of the Los Angeles Railway it would be necessary for it to enter this area, all of which brings about a condition similar to that of the McAdoo interests, which were presented for a vote of the people several years ago and defeated.

We are not going into the engineering or transportation features of this case at the present time, but are submitting the above to the board for its information and consideration, with recommendation that the information contained therein be transmitted to the Los Angeles City Council through its Public Utilities Committee.

## Preparing for Detroit's New Bus Service

The Detroit Department of Street Railways has ordered 120 additional new buses. These, with the ones previously ordered and 50 more, the purchase of which is contemplated immediately if they prove satisfactory, will supply the 200 de luxe buses promised by the department to replace the jitneys. The jitneys were recently ousted from the main Detroit streets as a result of the decision handed down by the Michigan Supreme Court over the long-fought issue. All the buses will be of a de luxe type and will be operated along the same routes or along routes paralleling the former lines of the ousted jitneys.

While the rate of fare to be charged on the new municipal buses which are to replace the jitneys ordered off the streets has not been definitely determined, it has been intimated by Del A. Smith, general manager of the municipal system, that the fare will be based upon a zoning system, and will vary from 25 cents for the extreme length of the line to 10 cents for the shorter rides. This will be somewhat in excess of the rates formerly charged by the jitneys. The general manager expressed the opinion that these 200 de luxe buses will give better service and handle more passengers with less confusion and street traffic delay than did the 500 jitneys.

Nine new bus routes have been approved by the City Council and the buses will be put into operation over these lines as fast as they are delivered. It is planned to have a number of the buses in operation by Dec. 1, and to have them all in operation by Jan. 1, 1929.

## Would Accommodate Employees of St. Louis Flying Field

The St. Louis Public Service Company has asked the Missouri Public Service Commission for authority to divert part of its bus service now in operation over federal highway No. 40 between Wellston and St. Charles, Mo., so as to furnish morning and late afternoon service between St. Louis and the St. Louis Flying Field at Bridgeton. It is proposed to have the bus which leaves the Wellston Loop at 7:30 a.m. make a side trip to the flying field over the Lucas and Hunt, the Natural Bridge and the Bridgeton Station roads and the bus leaving St. Charles, Mo., at 4:45 p.m. would make the same side trip for the accommodation of employees of the flying field who reside in St. Louis.

## More Bus Rights in Waterloo

Announcement has been made by Supervisor Leroy McDuffie that the Waterloo, N. Y., town board has granted a restricted franchise to the Geneva Railway Bus Lines, Inc. Claude R. Mann, operating the Finger Lakes Rapid Transit, withdrew his request for a franchise and his objections to the Geneva concern. During this meeting of the executive session of the town board of Waterloo, a proposed third line sponsored by Seneca Falls interests entering the field was discussed but no formal application for a franchise was made. Contingent upon the bus franchise being passed is an agreement that the Geneva, Seneca Falls & Auburn Railroad settle with Waterloo for taxes and assessments.

## Seeks Ten-Cent Fare in Marlboro

The Massachusetts Public Utilities Commission has asked the Boston, Worcester & New York Street Railway to file an amended schedule reducing the bus fare within Marlboro during the peak hours to 10 cents. This friendly action was the result of a petition filed by Mayor Winfield Temple of Marlboro, the company expressing its willingness to make such reduction if the commissioner ordered it. The bus line was established just previous to discontinuance of the company's cars.

## New Lines Will Serve Hudson Valley Route

The New York Public Service Commission granted a certificate on Nov. 16 to the Hudson Transportation Company, Inc., for the operation of bus lines between Glens Falls and Hudson Falls and Fort Edward; in Glens Falls and Saratoga Springs; and between Glens Falls and South Glens Falls.

The Hudson Valley Railway is now operating in communities proposed to be served by the new bus lines. Stockholders of the railway voted on Oct. 11 last to abandon the entire trolley service and the new bus line will provide transportation in its place after Dec. 1. Inasmuch as trolley operations will cease the commission holds that bus service will be necessary. The certificate just issued by the commission follows the granting of consents, where necessary, by the municipalities in which the bus line will operate.

Buses will be operated on practically the same schedule as now in effect by the railway, the company using 24 buses. A 10-cent fare zone will include South Glens Falls, Glens Falls and Hudson Falls, with transfer privileges to other

buses in Glens Falls. An additional 10 cents will be charged between Hudson Falls and Fort Edward and the Saratoga-Glens Falls ride will cost 80 cents.

## New Services Authorized in San Diego

A certificate of public convenience and necessity has been granted by the California Railroad Commission to the San Diego Electric Railway to operate auto stage service along Market Street in that city between 25th Street and Euclid Avenue (51st Street) and intermediate points. The commission has also granted a certificate to the company to operate auto passenger service between La Mesa and Spring Valley Junction and intermediate points.

## Experiment in Portland to Determine Needs

The Portland Electric Power Company, Portland, Ore., has extended its Willamette Boulevard bus route about 1 mile. The experiment is to be tried for 60 days to determine whether the service fills the need of the district according to the opinions of the residents and the City Council. This new service is not only longer in mileage, but affords important connections with other buses and city car lines.

## Belt Line in Boston

A license to operate a belt line of buses around Dorchester has been granted to the Boston Elevated Railway, Boston, Mass. The action followed a study of transit conditions covering a period of four weeks. Fare on the route is 6 cents.

## Supplementary Service Suggested for Houston

Plans for supplanting present railway service with a local bus service two miles long on Fannin Street, which is to be widened and repaved, were recently submitted to the city of Houston, Tex. These plans involve increased operating expenses estimated at from $72,882 to $126,452, annually, with no commensurate increase in revenue.

The Beeler Organization was asked by Mayor Holcombe to analyze the plans and study the whole problem. Its report does not approve the substitution as planned. It recommends, however, that the Fannin Street car line, the heaviest in the city, be continued as far as McGowen Avenue, which shortens it 0.9 miles, and that a through express bus line, 4.1 miles long, be established on Main Street from Franklin Avenue to Hermann Park.

This service on Main, the principal business street, one block from Fannin, it is pointed out, will improve the service to the whole central south side as well as the central business section, and provide service to Rice Institute, which was not included in the other plans.

It is estimated that this enlarged service may cause a reduction in the net of $10,134 annually, but it is pointed out that this is only a fractional part of what was contemplated in the plans that had been previously submitted. This loss should be speedily wiped out as the proposed line connects the business district with the rapidly growing apartment section.

## Service Expanded Near Petersburg

Bus service to the DuPont City section was instituted by the Petersburg-Hopewell & City Point Railway, Petersburg, Va., on Nov. 19. The buses will be run into the Atmospheric Nitrogen Company's plant area. The service will also be continued from the car depot into the plant area, thus giving it better transportation than it has had at any time in the past.

## Route to Boylston and Clinton Refused Acme Bus

A permit was refused by the Worcester, Mass., license board to the Acme Bus lines to operate buses on the city streets over a proposed route to Boylston and Clinton. The chairman of the Boylston Selectmen and two Selectmen of Clinton, officials of the Worcester Consolidated Street Railway and the Boston & Maine Railroad opposed the granting of the license.

The license board after careful study decided that public necessity did not demand the operation of two bus lines to Boylston and Clinton. At the present time the Consolidated is operating buses to Clinton by way of West Boylston and also through Boylston. The Acme lines sought to give hourly service from Worcester to Clinton by way of Boylston. Under the Consolidated schedule similar service is given alternating each half hour by way of Boylston and West Boylston.

# Financial *and* Corporate

## Good Showing by Buffalo Company

Still further improvement in the financial position of the International Railway, Buffalo, N. Y., is shown by the company's consolidated income account for the first nine months of 1928. The statement shows a net income of $577,846, compared with $114,984 for the corresponding period last year. Operating revenue was $27,000 under that of last year, largely because of the poor tourist season, but the decrease was more than offset by operating efficiencies and economies.

Operation and taxes totaled $6,891,485 as compared with $7,306,997 last year. The reduction is due to operating efficiencies and economies, and to the fact that an amortization charge of $253,665 included in the 1927 statement was discontinued, effective on Jan. 1, 1928, with the approval of the Public Service Commission and is therefore not included in the 1928 statement. There was a decrease of nearly $50,000 in fixed charges, largely through retirement of bonds for which the holders accepted preferred stock.

CONSOLIDATED INCOME ACCOUNT OF THE INTERNATIONAL RAILWAY

| Nine Months Ended Sept. 30 | 1928 | 1927 |
|---|---|---|
| Operating revenue | $8,430,190 | $8,457,031 |
| Operation and taxes | 6,891,485 | 7,306,997 |
| Operating income | $1,538,705 | $1,150,033 |
| Non-operating | 72,098 | 46,496 |
| | $1,610,803 | $1,196,529 |
| Fixed charges | 1,032,957 | 1,081,545 |
| Net income | $577,846 | $114,984 |

Amortization charge amounting to $253,665 is included in 1927 statement. With approval of Public Service Commission this charge has been discontinued effective Jan. 1, 1928, and is therefore not included in the 1928 statement.

In commenting on the continued improvement in I.R.C. financial position President B. J. Yungbluth said:

In accordance with the long established policy of Mitten Management the public is the first to benefit from the improvement. I.R.C. today is supplying service substantially better than Public Service Commission requirements. Cars are cleaner, brighter and in better mechanical condition than ever before. The number of riders who must stand because of rush-hour crowds has been steadily reduced and is much less than in any other great city of the United States. Although increased traffic congestion presents added difficulties, more than 90 per cent of all I.R.C. cars are operating on time. Safety has been greatly increased, accidents thus far being 28 per cent less than those of last year, on top of a 15 per cent reduction in 1927.

The improvement in I.R.C. credit made possible a large and costly program of track and paving reconstruction, which the company immediately undertook in co-operation with the city. Last year I.R.C. spent $250,000 for this work; this year a total of $375,000 was spent in streets selected co-operatively by the city and the company. In addition $400,000 was spent each year for track and paving maintenance, so last year's program with the work being done this year, reaches the staggering total cost of $1,425,000. In addition to the work contemplated, I.R.C. while unable to meet the demands of the city for reconstruction in additional streets, was able to co-operate by renewing its rails in those portions of Seneca and William Streets not covered by the program jointly agreed to by the city and the company.

As the sincerity of Mitten Management policy to meet its responsibility to the car riders first became evident there has developed a fuller understanding and a widespread spirit of sympathetic co-operation. The substantial accomplishments now on the record prove the wisdom of co-operative effort.

As the spirit of co-operation continues to

develop it will become increasingly evident that I.R.C. supplies to the Niagara Frontier a transit service that will compare favorably with that supplied anywhere.

Elsewhere in this issue of ELECTRIC RAILWAY JOURNAL there is an illustrated article descriptive of some of the recent track work of the company.

## Net Income on Detroit Municipal Lower for Year

For the year ended Oct. 31, 1928, total operating revenues of the Department of Street Railways, Detroit, Mich., were $24,202,398, including $3,234,332 for coach revenues, as against $23,774,542, including $3,236,849 for the year ended Oct. 31, 1927. Total operating expenses advanced from $18,179,871 to $18,881,729. These figures are inclusive of coach expenses amounting to $3,198,653 and $2,960,492 for 1928 and 1927 respectively. From a gross income of $4,777,267 in 1928 and a gross income in 1927 of $5,098,037, total deductions were $1,910,507 for this year and $1,898,474 for last year. This left a net income of $2,866,760 for this year's period and $3,199,562 for last year's period.

Statistics of the road show that the total number of railway passengers was 451,149,654 for the year ended Oct. 31, 1928, compared with 442,274,352 last year. Total coach passengers numbered 44,253,730 this year and 41,263,207 last year. Total revenue and transfer passengers were given at 495,403,384 for this year's period compared with 483,537,559 for the year ended Oct. 31, 1927.

## Improvement in Lincoln's Financial Position

For the first ten months of 1928 the Lincoln Traction Company, Lincoln, Neb., reports that it has earned, applicable to dividends, $22,268, compared with only $6,577 for the corresponding period of 1927. Due to substitution of buses for street cars the revenue from cars continues to decline, while that from buses increases. The total revenues from transportation for the ten months were $383,992, compared with $376,503, an increase of $7,486, while total revenues from all sources were $395,552, an increase of $7,223. Operating expenses and taxes show a decrease of $8,406, from $330,532 to $322,126, leaving the net income after operation and taxes at $73,425, compared with $57,797, a year ago. Deducting bond interest, amortization and interest on current indebtedness, there is carried to the dividend account $22,268. Property valuation exceeded $2,500,000.

## Interborough Deficit for Four Months Is $410,701

Gross revenue from all sources of the Interborough Rapid Transit Company, New York, N. Y., for the four months ended Oct. 31, 1928, was $21,543,264, an increase of $625,383 over a similar period of last year. Expenditures for operating and maintaining the property were $13,953,164, an increase of $1,145,446. The balance after deducting 5 per cent Manhattan dividend rental showed a deficit of $410,701, which represented a decrease of $107,896 over the four months' period ended Oct. 31, 1927.

## More Speculation on Tacoma Situation

First-hand knowledge of the Tacoma railway situation, in all its phases, is being sought by bondholders of the Tacoma Railway & Power Company and the Puget Sound Electric Railway, through the offices of William R. Peabody, Boston attorney, who, while not himself a bondholder, has been selected to gather the information which the bondholders committee desires.

Mr. Peabody is in Tacoma studying the situation. He has conferred with Commissioner Ira S. Davisson, and with Richard T. Sullivan, general manager of the transportation lines, and others of the companies involved, and has made a personal inspection of the properties.

The bondholders have no definite plan for solving the difficulties of the local transportation companies, which are in default upon their bonds, but may formulate some plan when they receive the information he has been asked to obtain. The Puget Sound Electric is now in the hands of a receiver and its property is to be sold for its value as a discontinued line since service is to be withdrawn on Jan. 1.

There has been some talk of the Tacoma Railway & Power Company, a subsidiary of the Puget Sound Electric, also being placed in the hands of a receiver. A plan of local men, headed by S. M. Jackson, to form a new company to take over the properties fell through some weeks ago.

## Supreme Court Denies Bondholders' Writ

Application for a *writ of certiorari* filed by the attorneys for the second mortgage bondholders of the old Kansas City Railways has been denied by the Supreme Court of the United States. The move was made in an attempt to get a hearing before that court. The plaintiffs contend they were discriminated against in the reorganization of the property out of which the Kansas City Public Service Company was evolved as the successor company.

## Slight Decrease in B.-M.T. Net

For the four months ended Oct. 31, 1928, the total operating revenues of the Brooklyn-Manhattan Transit Company, Brooklyn, N. Y., was $16,030,178, as against $15,657,278 for a similar period of the year previous. Total operating expenses were $10,665,024 against $10,443,562 for the four months' period of 1927. After the consideration of income deductions the net income for the 1928 period was $1,826,509, compared with $1,833,712 for the 1927 period.

## Conspectus of Indexes for November, 1928

Compiled for Publication in ELECTRIC RAILWAY JOURNAL by

ALBERT S. RICHEY

Electric Railway Engineer, Worcester, Mass.

| | Latest | Month Ago | Year Ago | Last 5 Years High | Last 5 Years Low |
|---|---|---|---|---|---|
| **Street Railway Fares*** 1913 = 4.84 | Nov. 1928 7.69 | Oct. 1928 7.66 | Nov. 1927 7.56 | Nov. 1928 7.69 | May 1923 6.88 |
| **Electric Railway Materials*** 1913 = 100 | Nov. 1928 145.1 | Oct. 1928 144.9 | Nov. 1927 141.3 | April 1923 175.3 | Feb. 1928 139.5 |
| **Electric Railway Wages*** 1913 = 100 | Nov. 1928 229.9 | Oct. 1928 229.9 | Nov. 1927 228.3 | Oct. 1928 229.9 | March 1923 206.8 |
| **Am. Elec. Ry. Assn.** Construction Cost (Elec. Ry.) 1913 = 100 | Nov. 1928 205.7 | Oct. 1928 205.5 | Nov. 1927 199.4 | March 1924 206.8 | Jan. 1923 187.3 |
| **Eng. News-Record** Construction Cost (General) 1913 = 100 | Nov. 1928 209.5 | Oct. 1928 207.7 | Nov. 1927 202.0 | March 1924 224.7 | Nov. 1927 202.0 |
| **U.S. Bur. Lab. Stat.** Wholesale Commodities 1926 = 100 | Oct. 1928 97.8 | Sept. 1928 100.1 | Oct. 1927 97.0 | March 1923 104.5 | April 1927 93.7 |
| **Bradstreet** Wholesale Commodities 1913 = 9.21 | Nov. 1928 13.01 | Oct. 1928 13.13 | Nov. 1927 13.39 | Dec. 1925 14.41 | July 1924 12.23 |
| **U. S. Bur. Lab. Stat.** Retail Food 1913 = 100 | Oct. 1928 156.8 | Sept. 1928 157.8 | Oct. 1927 156.1 | Nov. 1925 167.1 | May 1924 141.0 |
| **Cost of Living** Nat. Ind. Conf. Bd. 1914 = 100 | Oct. 1928 162.9 | Sept. 1928 163.4 | Oct. 1927 163.7 | Nov. 1925 171.8 | Feb. 1923 157.5 |
| **Industrial Activity** Elec. World—Kw.-hr. used 1923-25 = 100 | Oct. 1928 132.0 | Sept. 1928 134.5 | Oct. 1927 119.9 | Sept. 1928 134.5 | July 1924 73.4 |
| **Bank Clearings** Outside N. Y. City 1926 = 100 | Oct. 1928 105.1 | Sept. 1928 105.7 | Oct. 1927 100.4 | May 1928 108.4 | Aug. 1923 81.6 |
| **Business Failures** Number | Oct. 1928 1664 | Sept. 1928 1348 | Oct. 1927 1471 | Jan. 1924 2231 | Sept. 1928 1348 |
| Liabilities (Millions) | 43.24 | 22.11 | 35.98 | 122.95 | 22.11 |

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 136 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

# Personal Items

## New Company Takes Over Ohio Freight Business

D. R. Thomas is president and general manager of a new organization known as the Electric Railways Freight Company. Other officers are S. Jorgensen, secretary-treasurer; C. J. Laney, traffic manager; Edward Ackerman, auditor; F. W. Gerlach, general freight agent in charge of solicitation.

The new company takes over all the freight business of the Northern Ohio Power & Light Company, Pennsylvania-Ohio Power & Light Company and the Lake Shore Electric Railway, following the perfection of such consolidation. Joining these roads on Dec. 1 will be the Toledo & Indiana Railroad and the Ohio Public Service Company. The former line is between Toledo and Bryan, the latter extending from Toledo to Port Clinton.

Mr. Laney, who becomes traffic manager of the new organization, has been traffic manager of the Northern Ohio Power & Light Company for ten years or more. Mr. Gerlach has also been with the same company several years as Cleveland freight agent. Both men know the freight territory and have wide acquaintance. Mr. Laney had his headquarters in the Terminal Building, Akron.

Mr. Thomas has been employed by several companies in investigation work, while Mr. Jorgensen had been with the Lake Shore.

Consolidation of these freight departments will enable the companies to effect economies which could not otherwise be accomplished and it will also work to the benefit of shippers. With one directing head for the roads interchanging freight, equipment can be used to a greater advantage and with less delay. Operation can be so conducted that cars can be loaded going both ways in and out of the territory.

The office of the new company is at 704 Eagle Avenue, Cleveland, Ohio.

## R. M. Feustel Mentioned for Indiana Post

Robert M. Feustel, Fort Wayne, president of the Indiana Service Corporation, is being mentioned as probable chief of Insull-owned public utilities in Indiana and as possible successor to the late Robert I. Todd, who was president of the Indianapolis Street Railway. It is regarded as improbable, however, that a successor to Mr. Todd in the directorate and official staff of a dozen or more utilities will be selected until after the Indiana Public Service Commission has acted on the merger petition now before it.

The proposed merger would consolidate into the Indiana Electric Corporation, the vast Insull-owned Central Indiana Power Company, serving 179 Indiana Communities, the Terre Haute, Indianapolis & Eastern Traction Company and the Terre Haute Traction & Light Company.

The Indianapolis Street Railway is not a party to the proposed merger, but because of the interlocking directorate of the company with the companies to be merged with the Insull interests, it is regarded not unlikely that Mr. Feustel's selection to head the corporation would result in his election to succeed Mr. Todd as head of the railway at Indianapolis.

Mr. Feustel is a national utility figure. He was construction engineer for interurban and city railway properties in Northern Indiana from 1905 to 1907; assistant chief engineer of the Wisconsin Railroad Commission from 1907 to 1913; chief engineer of the Public Utilities Commission of Illinois from 1914 to 1915, and since that time president of the Indiana Service Corporation.

W. G. Marks, general manager of Chesterfield (England) transport department, has been appointed general manager of Nottingham Corporation Tramways, succeeding John Aldworth, who is retiring. Mr. Marks has had 27 years of experience in passenger transport. Among the tramway undertakings with which he has been associated are those of Middlebrough, Rotherham and Chesterfield.

# OBITUARY

## Alfred A. Green

Al Green, known the country over to electric railway men, died on Nov. 9, at Scranton, Pa., as a result of injuries sustained two weeks previously when he fell down a flight of stairs during one of his regular inspection trips. The remains were interred at Easton, Pa., on Nov. 12.

It has just been said that Al Green was known to electric railway men the country over. He was. But he was, perhaps, best known among such men in the East. For more than twenty years he has been connected with the Galena Signal Oil Company as its representative, except for a period of a few years some time ago when he was associated with the Columbia Machine & Malleable Iron Works.

To the problems of the Galena Company, lubricating experts, Mr. Green brought a well rounded career which covered a wide range of experience in electric railway maintenance and mechanical work. In that service he was one of the industry's pioneers, for he helped to build some of the early roads and then he wrote about his experience for publication, contributing to Electric Railway Journal a notable service of articles some time ago which stamped him as an expert in his line. Not only that, but Mr. Green contributed freely of his knowledge to the proceedings of the American Electric Railway Engineering Association.

Al Green had been making a name for himself long before 1904, but in that year he resigned as chief electrician and master mechanic of the Rochester Railway after ten years of service with the company. That date is important in the record of the career of the man, since it was destined to mark the turn in events which took him out of the operating end of the business and launched him on his career as lubricating expert.

Early in the year 1890 Mr. Green had gone to Rochester for the Brush Electric Company, Cleveland, to install the Short electric railway system there. On the completing of this work he remained there with the railway. Before that he had been superintendent of the testing department of the Brush Electric Company and previously superintendent of the Memphis Light & Power Company.

So it becomes evident that Mr. Green entered the field of the application of electricity to industry at its inception and that his active term of service covered the period from the little sputtering dynamos of the 80's to the massive machines of the present day. During all that time few men knew more than he about the part that proper lubrication plays in making high duty and high power machinery perform at the greatest mechanical efficiency. News of his death will come as a shock to a wide circle of acquaintances stretching across the country who had contact with Mr. Green over a period of more than a quarter of a century.

## Daniel E. Lenahan

Daniel E. Lenahan, assistant superintendent of equipment of the Third Avenue Railway, New York, N. Y., died suddenly on Nov. 21. He began his railroad career at the Seventh Avenue and 50th Street carhouse of the Metropolitan Street Railway in 1898 where he served first in the capacity of car shifter and later as carhouse clerk. Then he became a foreman in the inspection department of the Manhattan Elevated Railroad and in 1905 was transferred to the subway lines of the Interborough Rapid Transit Company where he served first as foreman of car equipment, later as yardmaster and finally as superintendent of car inspection. Some years later he was again transferred to what is now known as the New York Railways, where he served first as assistant superintendent of equipment and later as general superintendent. His appointment as assistant superintendent of equipment of the Third Avenue Railway became effective June 1, 1927.

# Activity of Equipment Market Continues

## Purchases of both track and line materials numerous. Illinois Central contemplates purchasing locomotives. Many buses ordered

ALTHOUGH no large projects have been announced during the past week, reports from a number of electric railways indicate that the market for material and supplies remains in good condition for this season of the year. Community Traction Company, Toledo, Ohio, continues its activities by placing orders for eighteen new motor coaches which will bring its bus fleet up to 106 coaches. All garage operations of this company will be centralized at a new $150,000 garage being built on the site of the Central Avenue carhouses. Both car and bus repair and maintenance operations will then be centralized in this location.

The Community Traction Company has also rehabilitated its Cherry Street line and overhauled these cars, installing additional motors and new control equipment. In view of the fact of increased earnings of this line, a contract has been let for the purchase of 120 motors with which 45 of the Peter Witt type cars will be equipped. Each car will then be equipped with four motors giving faster acceleration and smoother operation. This $150,000 rehabilitation program is to be completed about Jan. 1.

### Track Materials

Five thousand hemlock ties have been ordered by the Ottawa Electric Railway, Ottawa, Ontario. The Capital Traction Company, Washington, D. C., has placed orders for 3,000 steel tie plates for use with 4-in. T-rail. This company has also ordered 100 Thermit rail welding portions at a cost of $441. The Grand Rapids Railroad, Grand Rapids, Mich., has placed orders for 25 kegs of ⅞x5½-in. track bolts.

One hundred thousand granite paving blocks, 20,000 bags of cement, and 3,000 hemlock cross ties have been ordered by the Toronto Transportation Commission, Toronto, Ontario. The Dallas Railway & Terminal Company, Dallas, Tex., has ordered 5,000 creosoted pine ties and one car of mixed timbers and ties. Special work including ten mates and eight track switches has been ordered by the Virginia Electric & Power Company, Richmond, Va. This company has also ordered 500 track rail bonds.

To facilitate construction of the sewerage system to inclose the Des Peres River, the St. Louis Public Service Company, St. Louis, Mo., is making several changes in its track. The Oakland Avenue project calls for a temporary elevated loop structure of all steel construction resting on wood piles, describing a half circle around the old bridge from one shore to the other. In length it is about 150 ft., and connects with the tracks just above and below the bridge entrances. On Manchester Avenue, a short distance west of Oakland Avenue, a new bridge is to be constructed. This will be a permanent structure and will be approximately 150 ft. in length. The estimated cost of the two jobs is about $20,000.

### Overhead Line Equipment

Several fairly large orders for line material have been placed. The Toronto Transportation Commission has ordered 61,000 ft. of No. 8 waterproof triple braid copper wire which will be required for its city extension consisting of 7 miles of double track.

Twenty-five thousand feet of ¼-in. galvanized strand and 25,000 ft. of ⅜-in. galvanized strand have been ordered by the Louisville Railway, Louisville, Ky. Other line materials ordered by this company include 200 flexible approaches, 500 No. 00 clinch ears, 500 No. 000 clinch ears, 1,000 ft. of No. 0000 double braid weatherproof stranded copper wire, 500 spring lock hangers and miscellaneous electric switch repairs. The Virginia Electric & Power Company has ordered 100 trolley hangers and ten trolley cross-overs. Fifty splicing ears, 100 line hangers, eight overhead switches, and 200 crossarm pins have been ordered by the Grand Rapids Railroad.

### Rolling Stock

The Illinois Central Railroad, Chicago, Ill., is inquiring for four electric switching locomotives. The Virginia Electric & Power Company is remodeling its cars on the Norfolk division, requiring eight type K-75-A controllers. This company has also purchased five Twin Coaches.

The Capital Traction Company, Washington, D. C., has placed orders for one hundred 31-in. solid wrought carbon steel car wheels costing $2,775 and forty 21-in. and forty 31-in. heat-treated solid wrought carbon steel car wheels at a cost of $2,260. Dallas Railway & Terminal Company has ordered one car of brake shoes.

The Capital District Transportation Company, controlled by the United Traction Company, Albany, N. Y., has applied to the Public Service Commission for authority to issue notes for the purchase of three Versare Electric Motor Buses for use in the operation of its Troy Bus Line. The Illinois Power Company, Springfield, Ill., has ordered two 21-passenger street car type Studebaker buses and two 22-passenger Seminole parlor observation Studebaker buses. Two Mack, four-cylinder, 21-passenger city type buses have been delivered to the Wichita Falls Traction Company, Wichita Falls, Tex. The Louisville Railway, Louisville, Ky., has placed orders for fourteen 21-passenger street car type Studebaker buses.

The Toronto Transportation Commission has ordered one model SH-100-hp. Walter snow fighter complete with cab, electric light, starter and pneumatic tires. This company has also ordered 21 trolley loading platform beacons, four supports, equipped with red globe and guards.

The British Columbia Electric Railway is going to expend approximately $270,000 in substation construction in the near future. The Louisville Railway is making extensive repairs to the steam end of a 6,000-kw. turbo-generator and is rewinding the armature of a 3,000-kw. turbo-generator. The Capital Traction Company has ordered a McKee gas-fired steam cleaning outfit consisting of a 4-hp. steam boiler, solution tank, water ejectors, automatic pump unit, etc., for cleaning bus motors and chassis.

## Kansas City to Try Twin Coach Car

The Kansas City Public Service Company, Kansas City, Mo., will try out a new Twin Coach street car for a test period beginning in a few days. A Twin Coach bus has been on trial operation for several months. This new automotive-type, light-weight car is being awaited with interest by both the company and the public.

## American Standards Association Formed

Unanimous approval by the 37 member bodies of the establishment of the American Standards Association to succeed the American Engineering Standards Committee, is announced by William J. Serrill, assistant general manager of the United Gas Improvement Company of Philadelphia. Mr. Serrill was chairman of the Standards Committee, and now becomes president of the American Standards Association. One of the most important results of the abandonment of the committee form of organization will, according to Mr. Serrill, be a much greater degree of participation by trade associations in the direction of the national industrial standardization movement.

One of the first acts of the association will be the organization of a board of directors composed of twelve industrial executives. This newly created board, which was established in recognition of the increasing part which executives are playing in the standardization movement, will control the general administration and policies of the association. The old main committee, made up of representatives of all the member bodies, now becomes the Standards Council, and in its hands will rest all matters connected with the adoption and approval of national standards.

The officers of the association are, in addition to Mr. Serrill: Vice-president, Cloyd Chapman; secretary, P. G. Agnew; and assistant secretary, F. J. Schlink. The advisory committee of Industrial Executives includes: J. A. Farrell, president of the U. S. Steel Corporation, chairman; George B. Cortelyou, president of the Consolidated

Gas Company; John W. Lieb, senior vice-president of the New York Edison Company; L. F. Loree, president of the Delaware & Hudson Company; and Gerard Swope, president of the General Electric Company.

## Largest Electric Railway Exports to Canada

Of the $106,692 worth of railway motors, electric locomotives, mining and industrial locomotives, starting and controlling equipment for electric railway and vehicle motors, railway signals, switches, etc., exported from the United States during the month of August, 1928, Canada received $63,811 worth of this equipment. The division of these exports to Canada is as follows: Electric locomotives, $20,000; starting and controlling equipment for electric railway and vehicle motors, $2,439; and railway signals, switches and attachments, $41,372.

Japan was the second largest receiver of American electric railway exports, receiving $12,119 worth of mining and industrial locomotives and $1,100 worth of starting and controlling equipment. The classification of the total exports from the United States consists of railway motors, $450; railway electric locomotives, $20,000; mining and industrial locomotives, $22,876; starting and controlling equipment for railway and vehicle motors, $10,269; railway signals, switches and attachments, $53,097.

## Export Day at Power Show

As a result of the number of foreign visitors at the 1927 power show, the manufacturers of equipment who will exhibit at the Seventh National Exposition of Power and Mechanical Engineering at Grand Central Palace, New York, N. Y., Dec. 3 to 8, are showing a marked interest in the program that will be a feature of the exposition on Dec. 6, which will be Export Day.

The opening will take place at 2 p.m. Dec. 3. The Export Day program Thursday, Dec. 6, will be marked by the assembling of the members of the various foreign departments of the exhibitors in order to answer questions peculiar to the exporting of the various products. The foreign attendance last year brought representatives from 33 foreign countries and five insular possessions of the United States.

Requests have been received from a large number of foreign governments for invitations to the power show. Every exhibitor has been notified of the date of Export Day and special announcements in several languages will be posted at the entrances.

Included in the exhibits will be the latest type of equipment for the generation and distribution of power; for heating and ventilating buildings and factories; for handling material; for the control of temperature, pressure, volume and time; and machine shop equipment including metal and woodworking machines and tools.

## METAL, COAL AND MATERIAL PRICES F.O.B. REFINERY

| | Nov. 20, 1928 |
|---|---|
| **Metals—New York** | |
| Copper electrolytic, cents per lb. | 15.775 |
| Copper wire, cents per lb. | 17.875 |
| Lead, cents per lb. | 6.35 |
| Zinc, cents per lb. | 6.60 |
| Tin, Straits, cents per lb. | 51. |
| **Bituminous Coal, f.o.b. Mines** | |
| Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons | $4.375 |
| Somerset mine run, f.o.b. mines, net tons | 1.875 |
| Pittsburgh mine run, Pittsburgh, net tons | 1.80 |
| Franklin, Ill., screenings, Chicago, net tons | 1.30 |
| Central, Ill., screenings, Chicago, net tons | 1.15 |
| Kansas screenings, Kansas City, net tons | 1.625 |
| **Materials** | |
| Rubber-covered wire, N. Y., No. 14, per 1,000 ft. | $5.5 |
| Weatherproof wire base, N. Y., cents per lb. | 18.625 |
| Cement, Chicago net prices, without bags | 2.05 |
| Linseed oil (5-bbl. lots) N. Y., cents per lb. | 10.8 |
| White lead in oil (100-lb. keg), N. Y., cents per lb. | 13.25 |
| Turpentine (bbl. lots), N. Y., per gal. | 0.64 |

## Seasonal Decline of Industrial Production

Consumption of electrical energy by manufacturing plants indicates that a seasonal downward trend in rate of production was witnessed during October. Rate of October operations were 1.9 per cent under September, but were 10.1 per cent above October, 1927. Textiles reported an increase in rate of operations of 7.6 per cent over September, and rolling mills and steel plants, 2.5 per cent. Operations in the automobile industry were 14 per cent under September, but were still 24 per cent over October, 1927. Lumber and its products continued on a low plane.

The New England states reported an increase in the rate of production of 4.7 per cent over 1927, the Middle Atlantic states 19.7 per cent, the North Central states 24.8 per cent, and the Western states 18.2 per cent. The Southern states reported operations 3.5 per cent under October last year.

The remaining months of the year will probably witness a gradual drop in rate of activity, though general operations may continue on a comparatively high plane, at least until the opening of spring.

## TRADE NOTES

American Electric Switch Corporation, Minerva, Ohio, has placed a direct factory representative in the metropolitan district discontinuing the services of Holland & Monaghan, manufacturer's representatives. The New York office and warehouse is now located at 430 East 53rd Street with G. E. Lindstrom as manager.

National Flue Cleaner Company, Groveville, N. J., manufacturers of the National Soot Blower for return tubular boilers, announces the appointments of three new Ohio sales representatives; namely, Craun-Liebing Company, Cleveland, Dennis Engineering Company, Columbus, and the Bishop Engineering Company, Cincinnati. Other recent appointments are the Power Plant Efficiency Company of Indianapolis, Ind., and the Rathburn Company of El Paso, Tex.

Vernon B. King, formerly service manager at Toronto, Ontario, for the White Motor Company, Cleveland, Ohio, has been promoted to the position of export service manager. In his new capacity he will have charge of foreign truck and bus service throughout the world.

Timken Roller Bearing Company, Canton, Ohio, put into effect a program which will provide the necessary equipment for raising the company's present output of 175,000 bearings per day to over 200,000 per day. The program has necessitated the expenditure of about $6,000,000 during the current year and covers additions to both the steel mill and bearing factory.

C. F. Pease Company, Chicago, has moved its New York sales office and display room, formerly located in the Grand Central Terminal, New York City, to new quarters occupying the entire Seventh Floor, Ashforth Building, at 12 East 44th Street, New York City. An increase in sales personnel has also been made.

Harold C. Osman, secretary of the Nugent Steel Castings Company, Chicago, Ill., and heretofore in charge of sales for that company, has been appointed Works Manager.

Rudd H. Bender, formerly with the Brown Body Company, has joined the Bender Body Company, Cleveland, Ohio, as sales representative.

## ADVERTISING LITERATURE

Wagner Electric Corporation, St. Louis, Mo., has just issued a new bulletin describing Wagner large RA single-phase repulsion-induction motors. It covers such subjects as type of single-phase motors, history of repulsion-induction motors, operating principles, sleeve and ball bearing construction, ventilation, and construction features of stator, end plate, rotor and rocker arm. The bulletin is illustrated with numerous drawings and photographs.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has just released two publications on electric railway equipment. "High-Speed Motors and W-N Drive—D.M.F. 5126" contains complete construction details of this new double-reduction method of street car drive. "Electric Freight Haulage Increases Earnings—D.M.F. 5113" is a discussion of the possibilities for freight service on electric railways and some facts about Westinghouse equipment available for such service.

American Electric Switch Corporation, Minerva, Ohio, has issued a new catalog covering its line of safety switches, meter switches and fuse panels.




# Montreal's Articulated Cars

Just recently two articulated units of a new design were placed in service on the lines of the Montreal Tramways, Montreal, Canada. Along with other well-known makes of equipment, these cars are furnished with Peacock Staffless Brakes.

This is but another example of the confidence that progressive railway men have in the time tested hand brakes that have no equal for power, lightness, durability and consistent functioning under the most adverse conditions.



## NATIONAL BRAKE CO., Inc.

890 Ellicott Sq., Buffalo
New York

*Conadion Representative*
Lyman Tube & Supply Co., Ltd., Montreal, Can.
*General Sales Representotives*
The Ellcon Co., 50 Church St., New York



# Peacock

Reg. U. S. Pat. Office

# Staffless —Brakes



# Do You Buy Brake Shoes On Price Or Ultimate Cost?

THERE'S no guesswork connected with the use of Diamond "S" Brake Shoes on all cars. Every property which has standardized on the Diamond "S" type shows a lower brake shoe cost per car mile and uses fewer brake shoes—an additional annual saving in labor cost of application and removal of shoes.

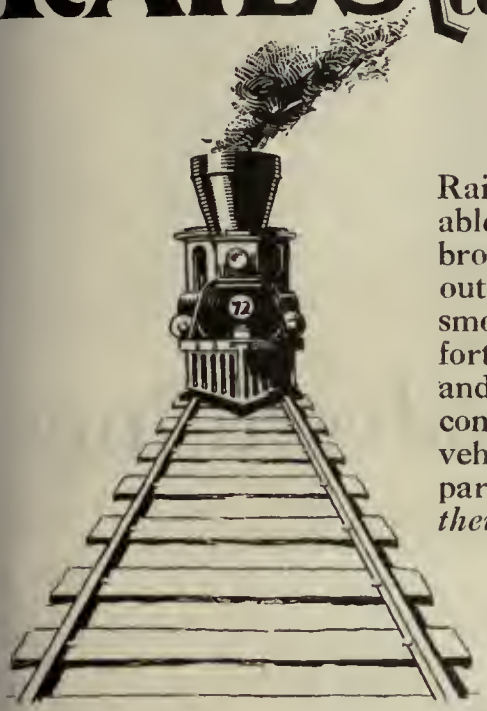
The photograph shows two piles of worn out Brake Shoes. The smaller pile shows the Diamond "S" scrap left after doing the same amount of work as the Cast Iron shoes in the larger scrap pile.

*"Best by Test"*

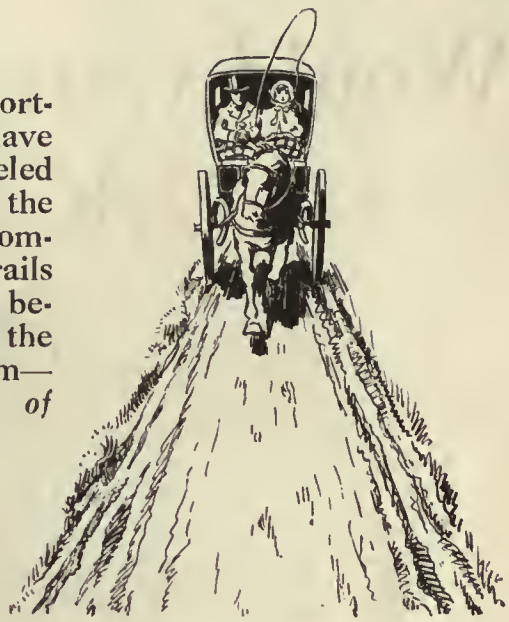
**THE AMERICAN BRAKE SHOE AND FOUNDRY COMPANY**

30 CHURCH ST., NEW YORK
332 SO. MICH. AVE., CHICAGO

# RAILS {WERE ONCE MORE COMFORTABLE THAN} ROADS



Rails were once more comfortable than roads, but roads have broadened and have leveled out until they match the smoothness of a rail. The comfort competition between rails and road, therefore, has become a competition of the vehicles that traverse them—particularly the *comfort of their seats.*



With the modern highroad providing as level and as smooth a path as the steel rail, electric railways can no longer rely on rails alone to attract their riders. They must at least *equal* the comfort of other carriers and the seat and its arrangement is, of course, the most important item of equipment in this respect.

Hale & Kilburn seating engineers have recognized this importance and have developed car seats and seating arrangements which, in every type of city and interurban service, afford the greatest comfort to your riders. The comfort problem is a *real* one and it will be worth your while to seek the advice of engineers who have made a study of this subject during the last fifty years.



**The H & K Double Chair No. 900D**
The most luxurious and comfortable development ever made in electric railway seats.

# HALE & KILBURN SEATS

*"A Better Seat for Every Type of Modern Transportation Service"*

## HALE & KILBURN COMPANY

General Offices and Works: 1800 Lehigh Avenue, Philadelphia

Sales Offices:

Hale & Kilburn Co., Graybar Bldg., New York
Hale & Kilburn Co., McCormick Bldg., Chicago
E. A. Thornwell, Candler Bldg., Atlanta
Frank F. Bodler, 903 Monadnock Bldg., San Francisco
T. C. Coleman & Son, Starks Bldg., Louisville
W. L. Jefferies, Jr., Mutual Bldg., Richmond
W. D. Jenkins, Praetorian Bldg., Dallas, Texas
H. M. Euler, 146 N. Sixth St., Portland, Oregon
C. S. Wright Co., 66 Temperance St., Toronto, Ont., Canada

*This is one of a series of McGraw-Hill advertisements directed originally to advertising men in an effort to make industrial advertising more profitable to buyer and seller. It is printed in these pages as an indication to readers that McGraw-Hill publishing standards mean advertising effectiveness as well as editorial virility.*

# Would your banker O.K. your industrial advertising?

A machinery manufacturer went to his banker to finance a program of plant expansion.

He had a determined idea of spending $200,000 for advertising, but the banker turned him down because he had no definite industrial marketing policy or advertising plan.

*a banker says*

"The banker may rightly ask you these five questions about your advertising campaign:

1. Who are the logical purchasers for your goods?
2. Who are the men controlling the purchase of those goods?
3. What is the probable quantity you can sell this year, next year, and the year after that?
4. What are the channels through which your story should be told?
5. What kind of copy will convince the buyer that it is to his particular advantage to purchase your goods in preference to similar products sold by your competitors?"

ALLAN B. COOK, *Vice-President, Guardian Trust Company, Cleveland*

How manufacturers selling to the industrial field are co-ordinating their advertising with the Industrial Marketing plan outlined by this banker is revealed in the McGraw-Hill book, *Industrial Marketing at Work.*

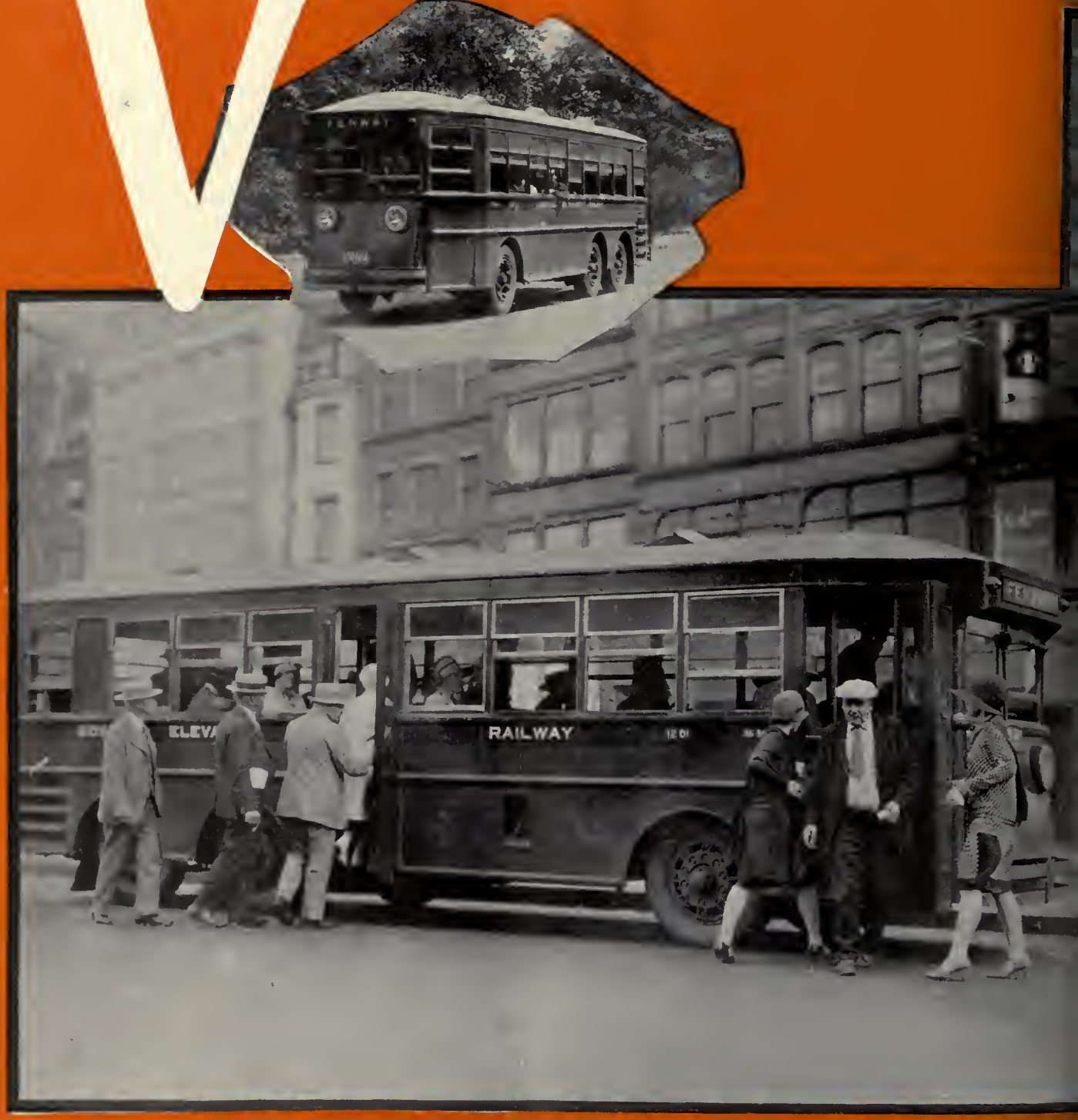
*—The publishers*

F-4

# MORE
# VERSARES




# for Boston




BOSTON is about to increase the size of its fleet of Versares. For a number of months the Boston Elevated Company has operated a fleet of Versare Gas-Electric Coaches. The performance of this fleet of light-weight, large-capacity transportation units in handling peak loads, maintaining schedules and keeping maintenance costs down to bed rock has demonstrated clearly the advantages of Versare engineering. As a result, the Boston Elevated has ordered more Versares.









Versares are distinctively an *engineering* product. They utilize every square foot of space to produce revenue. Their patented bridge type truss construction, with the use of Duralumin, makes possible large-capacity, light-weight passenger-carrying vehicles, rigid and strong. No floor, roof or panels are necessary to give required strength.

# VERSARE

## Electric Coaches
## Gas-Electric Coaches
## and Rail Coaches





The success of Versares in Boston parallels the performance of the Versare fleets serving other prominent traction properties. Versare Transportation Units have proved their superior features by hundreds of thousands of miles of operation.

The standard Versare structure can be adapted to practically any arrangement, and equipped with pneumatic or standard steel car wheels. Versare patented sectionalized structure allows quick repair or replacement without dismantling entire side.

**Versare Corporation**
**Albany, N. Y.**







"CAR CARD ADVERTISING
ALMOST EVERYWHERE"



ELECTRIC railway executives have been solving transportation problems and meeting the needs of the people every day, summer and winter, rain and shine, for many decades. No other group is so eminently qualified to economically render proper mass transportation.

The ability to maintain any service as a real asset can only be proven by a long period of successful operation.

BARRON G. COLLIER
INCORPORATED

NEW · YORK · CITY

# Bankers and Engineers


**Ford, Bacon & Davis**
Incorporated
**Engineers**
39 Broadway, New York
PHILADELPHIA CHICAGO SAN FRANCISCO

**The J. G. White Engineering Corporation**
Engineers — Constructors
Steam and Hydro-Electric Power Plants, Gas Plants, Steam and Electric Railroads, Transmission Systems, Buildings and Industrial Plants.
43 Exchange Place New York

**STONE & WEBSTER**
Incorporated
Design and Construction
Examinations Reports Appraisals
Industrial and Public Service Properties
NEW YORK BOSTON CHICAGO

**THE BEELER ORGANIZATION**
Transportation, Traffic, Operating Surveys
Better Service—Financial Reports
Appraisals—Management
52 Vanderbilt Ave. New York

**SANDERSON & PORTER**
ENGINEERS
PUBLIC UTILITIES & INDUSTRIALS
Design Construction Management
Examinations Reports Valuations
CHICAGO NEW YORK SAN FRANCISCO

**ENGELHARDT W. HOLST**
*Consulting Engineers*
Appraisals Reports Rates Service Investigation
Studies on Financial and Physical Rehabilitation
Reorganization Operation Management
683 Atlantic Ave., BOSTON, MASS.

**ALBERT S. RICHEY**
ELECTRIC RAILWAY ENGINEER
WORCESTER, MASSACHUSETTS
REPORTS - APPRAISALS - RATES - OPERATION - SERVICE

**STEVENS & WOOD**
Incorporated
*Engineers and Constructors*
20 Pine Street, New York
*Transportation Examinations and Reports*

C. B. BUCHANAN, President — W. H. PRICE, JR., Sec'y-Treas. — JOHN F. LAYNG, Vice-President
**BUCHANAN & LAYNG CORPORATION**
*Engineering and Management, Construction*
*Financial Reports, Traffic Surveys*
*and Equipment Maintenance*
BALTIMORE, 1004 Citizens National Bank Bldg. — Phone: Hanover: 2142 — NEW YORK, 49 Wall Street

**WALTER JACKSON**
*Consultant on* Fares and Motor Buses
The Weekly and Sunday Pass—Differential Fares—Ride Selling
Holbrook Hall 5-W-3
160 Gramatan Ave., Mt. Vernon, N. Y.

**HEMPHILL & WELLS**
CONSULTING ENGINEERS
Gardner F. Wells Albert W. Hemphill
*APPRAISALS*
INVESTIGATIONS COVERING
Reorganization Management Operation Construction
50 East 42nd St., New York City

**McCLELLAN & JUNKERSFELD**
Incorporated
ENGINEERING AND CONSTRUCTION
Examinations—Reports—Valuations
Transportation Problems—Power Developments
68 TRINITY PLACE NEW YORK

**KELKER, DeLEUW & CO.**
CONSULTING ENGINEERS
REPORTS ON
Operating Problems Valuations Traffic Surveys
111 W. Washington Street, Chicago, Ill.

**BYLLESBY**
ENGINEERING AND MANAGEMENT CORPORATION
231 S. La Salle Street, Chicago
New York Pittsburgh San Francisco

**E. H. FAILE & CO.**
*Designers of*
Garages— Service Buildings— Terminals
441 LEXINGTON AVE. NEW YORK

**SCARR TRANSPORTATION SERVICE, INC.**
*Railway and Highway Consulting Engineers*
An organization of experienced engineers, prepared to assist you in the installation of highway operations as a substitute for or a supplement to your rail operations.
225 BROADWAY, NEW YORK

**THE P. EDWARD WISH SERVICE**
50 Church St. NEW YORK — *Street Railway Inspection* DETECTIVES — 131 State St. BOSTON

When writing the advertiser for information or prices, a mention of the Electric Railway Journal would be appreciated.

**NACHOD & UNITED STATES SIGNAL CO., INC.**
LOUISVILLE, KY.
BLOCK SIGNALS
FOR
ELECTRIC RAILWAYS
HIGHWAY CROSSING SIGNALS



**Waterproofed Trolley Cord**
The finest that science and skill can produce. For endurance, economy and positive satisfaction, use Silver Lake A.
SILVER LAKE COMPANY
SILVER LAKE A
Newtonville Mass.
*Manufacturers of bell, trolley, signal and other cords.*

**RAILWAY UTILITY COMPANY**
CAR COMFORT WITH
UTILITY
HEATERS
REGULATORS
VENTILATORS
2241-2247 Indiana St. Chicago, Ill. — *Write for Catalogue* — 1328 Broadway New York, N. Y.

**EIGHT WORKS**
RAMAPO-AJAX-ELLIOT
BELLEVUE, NEW YORK
NIAGARA FALLS, N.Y.
CHICAGO, ILLINOIS
EAST ST. LOUIS, ILL.
PUEBLO, COLORADO
SUPERIOR, WISCONSIN
LOS ANGELES, CAL.
NIAGARA FALLS, ONT., CANADA
**Ramapo Ajax Corporation**
RAMAPO AUTOMATIC RETURN SWITCH STANDS AND RACOR DASH POTS FOR PASSING SIDINGS
MANGANESE WORK A SPECIALTY
*Sales Office* 30 Church St. New York
*Also at all works*

**GOLD** CAR HEATING & LIGHTING CO.
220 36th St., Brooklyn, N. Y.
ELECTRIC HEATERS WITH OPEN COIL OR ENCLOSED ELEMENTS
THERMOSTAT CONTROL—VENTILATORS
WRITE FOR NEW CATALOGUE

*The* DIFFERENTIAL CAR



*Standard on 60 Railways for*
Track Maintenance
Track Construction
Ash Disposal
Coal Hauling
Concrete Materials
Waste Handling
Excavated Materials
Hauling Cross Ties
Snow Disposal
*Use These Labor Savers*
Differential Crane Car
Clark Concrete Breaker
Differential 3-way Auto Truck Body
Differential Car Wheel Truck and Tractor
THE DIFFERENTIAL STEEL CAR CO., Findlay, O.

# Arc Weld Rail Bonds
AND ALL OTHER TYPES
*Descriptive Catalogue Furnished*
**American Steel & Wire Company**
CHICAGO, NEW YORK, BOSTON, CLEVELAND, WORCESTER, PHILADELPHIA, PITTSBURGH, BUFFALO, DETROIT, CINCINNATI, BALTIMORE, WILKES-BARRE, ST. LOUIS, KANSAS CITY, ST. PAUL, OKLAHOMA CITY, BIRMINGHAM, MEMPHIS, DALLAS, ATLANTA, DENVER, SALT LAKE CITY
EXPORT REPRESENTATIVE: U. S. STEEL PRODUCTS CO., NEW YORK.
PACIFIC COAST REPRESENTATIVE: U. S. STEEL PRODUCTS COMPANY, SAN FRANCISCO, LOS ANGELES, PORTLAND, SEATTLE.

**Kalamazoo Trolley Wheels**
The value of Kalamazoo Trolley Wheels and Harps has been demonstrated by large and small electric railway systems for a period of thirty years. Being exclusive manufacturers, with no other lines to maintain, it is through the high quality of our product that we merit the large patronage we now enjoy. With the assurance that you pay no premium for quality we will appreciate your inquiries.



THE STAR BRASS WORKS
KALAMAZOO, MICH., U. S. A.



**Johnson Electric Fare Boxes**



and overhead registers make possible the instantaneous registering and counting of every fare. Revenues are increased 1½ to 5% and the efficiency of one-man operation is materially increased. Over 5000 already in use.
**Johnson Fare Box Co.**
*4619 Ravenswood Ave., Chicago, Ill.*

THE WORLD'S STANDARD
**"IRVINGTON"**
Black Varnished Silk, and Varnished Cambric, Yellow Varnished Paper
Irv-O-Slot Insulation
Flexible Varnished Tubing
Insulating Varnishes and Compounds
**Irvington Varnish & Insulator Co.**
Irvington, N. J.
*Sales Representatives:*
Mitchell-Rand Mfg. Co., N. Y.
E. M. Wolcott, Rochester
I. W. Levine, Montreal
A. L. Gillies, Toronto
Prehler Brothers Inc., Chicago
White Supply Co., St. Louis
Clapp & LaMoree, Los Angeles
Martin Woodard, Seattle
Consumers' Rubber Co., Cleveland

# AMERICAN BRIDGE COMPANY

**71 Broadway, New York**



*Highway Bridge across Russian River at Guerneville, Cal.*

*Manufacturers of Steel Structures of all classes, particularly*

## BRIDGES AND BUILDINGS

HIGHWAY BRIDGES

POWER HOUSES — BOILER HOUSES

ROOF TRUSSES — COLUMNS, GIRDERS

*Offices in Principal Cities*



## They cost less because they last longer

Boyerized Parts are known for their long life and resistance to wear. That explains why leading companies consider them as "standard."

This longer life is due to several factors: the metals and steels from which they are made, the manufacturing operations, heat treating, etc., to which these materials are subjected, and finally the design of the finished parts.

All these cost money. Hence Boyerized Parts cost a little more originally. But in the long run, they save many times their extra cost in labor and replacements. It pays to specify and insist on them.

**BEMIS CAR TRUCK COMPANY**
*ELECTRIC RAILWAY SUPPLIES*
SPRINGFIELD, MASS.

Representatives:
F. F. Bodler, 903 Monadnock Bldg., San Francisco, Cal.
W. F. McKenney, 54 First Street, Portland, Ore.
J. H. Denton, 1328 Broadway, New York City, N. Y.
A. W. Arlin, 519 Delta Building, Los Angeles, Cal.

- Brake Pins
- Brake Hangers
- Brake Levers
- Pedestal Gibs
- Brake Fulcrums
- Center Bearings
- Side Bearings
- Spring Post Bushings
- Brake Bushings
- Bronze Bearings
- Bolster and Transom Chafing Plates
- Spring Posts
- McArthur Turnbuckles
- Manganese Brake Heads
- Manganese Truck Parts

# BOYERIZED PARTS



# Let this Remarkable Register *PAY FOR ITSELF*

HERE'S a ticket-printing register designed and built to meet the demand for a *faster, safer* and *more economical* method of collecting fares. Here's the new OHMER Ticket-Printing Register, Type 80 . . . small in size, light in weight and low in cost . . . a register which will speed up your service, stop losses, increase your profits, reduce your overhead . . . a register which will save you thousands of dollars every year!

### *Here's the way it works!*

All the details of a fare transaction are quickly set up by moving certain levers. As this is being done, the amount of the fare is indicated in large white figures at the top of the register. The figures are visible to both operator and passenger. Then by simply pressing an electric button a completely printed ticket is issued and a duplicate record is made on a detail strip locked in the register. In addition, the fares collected are totalized. This total can be printed on the detail strip at any time.

### *Pays for itself many times*

If the Type 80 Register did nothing but print tickets—if it did nothing but safeguard collections—if it did nothing but simplify bookkeeping and auditing—if it did only *one* of these things, it would *more* than *pay* you to install an OHMER Type 80 Register on every one of your cars and busses. But this register does *all* these things. And it does all at the *same time*. It will actually *pay for itself* over and over again. You can't *afford* to be without the new OHMER System.

### *Investigate the Type 80 Register* TODAY

Learn more about this remarkable money-saving register. Let us send you *all* the information about it. Let us *prove* to you it's the most practical and useful machine of its kind ever built. Just fill in the coupon below—or pin it to your letterhead—and drop it in the mail. There's no obligation entailed. Write today—*now*.

THE OHMER FARE REGISTER COMPANY
Dayton, Ohio, U. S. A.

### Other OHMER Products

Cash Registers of many types and for every kind of business. Fare Registers for recording the details of fare collection, quickly and accurately. Ticket-Printing Registers of various kinds for transportation and commercial use. Ticket-Printing and Non-Printing Taximeters, Mileage Meters, such as the Odometer, Hub-Odometer, Recordograph and Truck Auditor. Four styles of fare boxes. Industrial Counters for many purposes.

OHMER
Reg. U. S. Pat. Off. and other Countries
FARE REGISTER COMPANY
Dayton, Ohio, U. S. A.

The Ohmer Fare Register Co.,
Dayton, Ohio, U. S. A.

I would like to have complete information regarding the operation and installation of the OHMER Ticket-Printing Register, Type 80.

*Name*_____

*Address*_____

# Louisville Railway Company—Buys Sixteen STUDEBAKER BUSSES for Additional Feeder Service




In the suburbs of Louisville, Ky., not served by street cars the Louisville Railway Company is using 37 busses of which 16 are Studebakers acting as feeders to the city electric lines. ¶ This service with express schedules for street cars, and busses stopping at each street intersection, gives Louisville ideal rapid transit.

## STUDEBAKERS are



*This fleet of Studebaker street car busses provides an important link in Louisville's rapid transit system.*

first cost
operating cost
maintenance
depreciation
**Lower**

STUDEBAKER engineering genius is responsible for the production of bus equipment which admirably meets present day requirements.

This is recognized by the biggest operators in the country as evidenced by recent purchases of Studebaker busses.

It must be significant when private and municipal operators in Seattle; Detroit; Louisville; Havana, Cuba; Lexington, Kentucky; Nashville, Tenn; Columbus, Ohio; Columbus, Georgia; and many other bus centers are buying Studebakers in large quantities. There must be a reason—here it is.

Studebaker busses are lower in first cost than any other units of comparable quality and capacity. They have earned a splendid reputation among bus owners for their low operating cost and dependable performance.

Lower maintenance is reflected in minimum repairs required. Clean cut design permits faster service work when needed.

There is tremendous mileage built into Studebaker busses—precision exercised in construction plus the high quality of materials used insures long life and dependable performance. For instance, the Consolidated Coach Company of Lexington, Kentucky, which operates 81 Studebaker units, reports mileage records in excess of 199,000 miles for some of its busses. This spells low depreciation.

**Studebaker Bus Models and Prices**

75 Junior Chassis—158-inch W. B. ..... $2410
Chassis only, single or dual rear wheels ..... 4520
15-Passenger Cross-Seat Sedan

76 Special Chassis—184-inch W. B. ..... $2775
Chassis only, single or dual rear wheels ..... 6395
22-Passenger Seminole Observation Parlor Car

75 Heavy Duty Chassis—184-inch W. B. ..... $3275
Chassis only, dual rear wheels ..... 5895
21-Passenger Street Car Bus

All prices F. O. B. Factory. Purchase can be arranged on Studebaker's liberal budget payment plan.

THE STUDEBAKER CORPORATION OF AMERICA,
Dept. B South Bend, Ind.

Please send complete information on Studebaker Busses, without obligation.

We have_____busses at present. Check below the Studebaker Bus about which you desire information.

Body Model: Sedan___Seminole___Street Car___

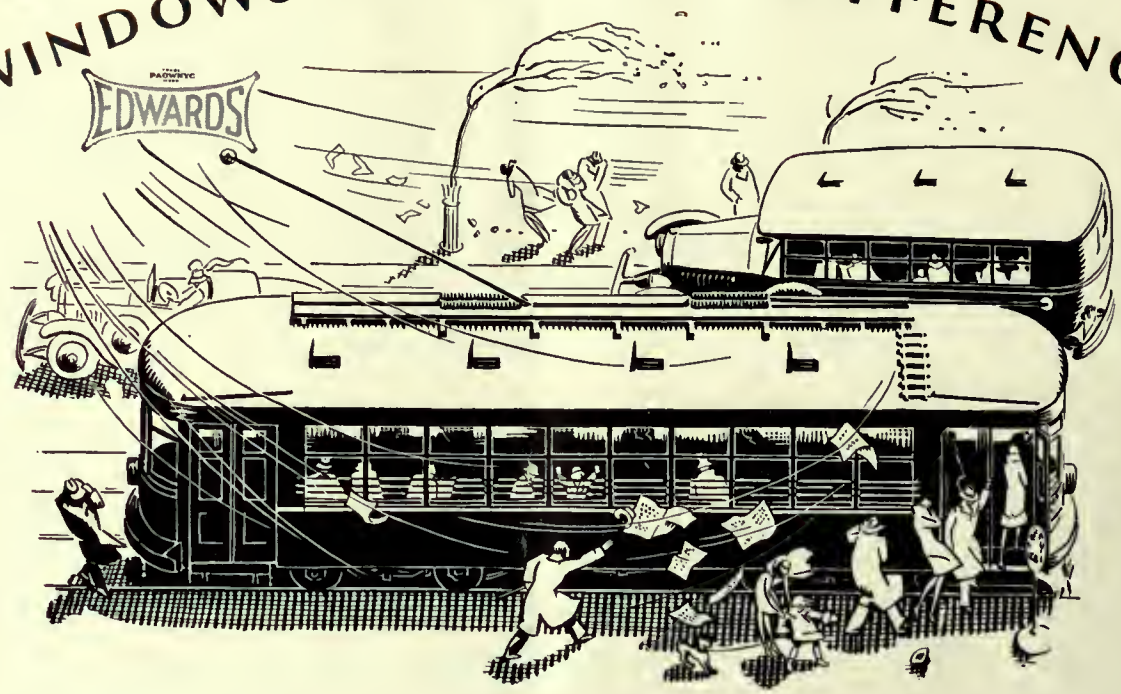
Name_____

Address_____

State_____ B-12-28

**Profit Makers**

# WINDOWS DO MAKE A DIFFERENCE




## And Edwards Metal Sash Makes the Difference

Chilly November air, leaking through rattling windows like water through a sieve, doesn't build good will for your service.

Windows may be a detail—but they are a very important detail when the comfort of passengers is concerned.

Cars and motor coaches equipped with Edwards Metal Sash can be comfortably warm. The windows are airtight. And, open or closed, windows with Edwards Metal Sash will not rattle.

For passenger comfort, for years of service at practically no maintenance cost, equip your cars and motor coaches with Edwards Metal Sash.

O. M. EDWARDS CO.
New York Syracuse, N. Y. Chicago

*Canadian Representatives:*
LYMAN TUBE & SUPPLY CO., LTD.
Montreal and Toronto

# Edwards Metal Sash

# FREE

## Holiday Stamping Offer

Until January 1st, 1929 we will stamp your name, or a friend's name, in gold on the front cover of this book. Orders for stamped copies should be accompanied by price and, of course, stamped books are not returnable. Offer expires January 1st, 1929.

Richey's

## Electric Railway Handbook

Electric railway executives, engineers, and operating men have long respected Richey's ELECTRIC RAILWAY HANDBOOK as the one great pocketbook of practice data, formulas and tables in the electric railway field. It covers every phase of electric railway work from Roadbed and Track to Signals and Communication.




This widely known handbook is virtually an encyclopedia on modern electric railway organization, administration and operation.

Second Edition, 708 pages, flexible, pocket size, fully illustrated, $4.00 net, postpaid.

It presents

(1) Data on subjects which come up in everyday electric railway practice for constant use by the operating, constructing and designing engineer.

(2) Material of service to the non-technical manager or operator.

(3) Reference material on electric railway practice for those who are specializing in other or allied fields.

Information every electric railway man needs—the latest and best methods—changes in practice and theory—that's the New Richey.

McGRAW-HILL
FREE STAMPING OFFER COUPON

McGraw-Hill Book Co., Inc., 370 Seventh Avenue, New York, N. Y.

Send me RICHEY'S ELECTRIC RAILWAY HANDBOOK, $4.00, with name stamped in gold on front cover. I enclose proper remittance and understand that stamped books are not returnable. (This offer expires Jan. 1, 1929.)

Name to be stamped .....

Signed .....
(Please print)

Address .....

Official Position .....

Name of Company .....

E. 11-24-28



## NUER

With the Nuer the lance is his constant companion.

It serves as his weapon and his eating utensil, as well as a handy tool for many uses.

His expertness resulting from this standardization and specialization enables the Nuer to secure a fine living with a minimum of effort.

And after all, isn't that just what the operator of electrical machines secures from standardization and specialization in Morganite Brushes—fine operation with a minimum of effort.

That may not be *new* to many, but speaking of the *Nuer* life, have you investigated the *newest* Morganite—the electro-graphitic grades?

Morganite Brush Co., Inc.

*Main Office and Factory*
*3302-3320 Anable Ave., Long Island City, N. Y.*

DISTRICT ENGINEERS AND AGENTS

***Pittsburgh,*** Electrical Engineering & Mfg. Co., 909 Penn Ave.
***Cleveland,*** Electrical Engineering & Mfg. Co., 320 Union Building.
***Baltimore,*** O. T. Hall, Sales Engineer, 432 North Calvert St.
***Revere, Mass.,*** J. F. Drummey, 75 Pleasant Street.
***Los Angeles,*** Electrical Engineering Sales Co., 502 Delta Bldg.
***San Francisco,*** Electrical Engineering Sales Co., 222 Underwood Bldg.
***Toronto, Can.,*** Railway & Power Engineering Corp., Ltd., 133 Eastern Ave.
***Montreal, Can.,*** Railway & Power Engineering Corp., Ltd., 68-70 St. Antoine St.
***Winnipeg, Can.,*** Railway & Power Engineering Corp., Ltd., P. O. Box 325.

*"The Standard for Rubber Insulation"*

## INSULATED WIRES and CABLES

*"Okonite," "Manson," and Dundee "A" "B" Tapes*

*Send for Handbook*

The Okonite Company

The Okonite-Callender Cable Company, Inc.

*Factories,* PASSAIC, N. J. PATERSON, N. J.

*Sales Offices:* New York Chicago Pittsburgh St. Louis Atlanta Birmingham San Francisco Los Angeles Seattle

Pettingall-Andrews Co., Boston, Mass.

F. D. Lawrence Electric Co., Cincinnati, O.

Novelty Electric Co., Phila., Pa.

*Can. Rep.:* Engineering Materials Limited, Montreal.

*Cuban Rep.: Victor G. Mendoza Co., Havana.*

Advertisements for the

## Searchlight Section



Can be received at the New York Office of Electric Railway Journal until 10 a. m.

**Wednesday**

For issue out Saturday

0220

## RAIL JOINTS

The Rail Joint Company

165 Broadway, New York City

Efficient Bus Heating

*with*

**The N-L Venti-Duct Heater**

THE NICHOLS-LINTERN CO.

7960 Lorain Ave. Cleveland, Ohio

## RAIL GRINDERS AND WELDERS

**Railway Track-work Co., Philadelphia**

682

## ROEBLING

Electrical Wires & Cables

John A. Roebling's Sons Co. Trenton, N. J.

UNA

RAIL JOINTS

DYNAMOTORS

WELDING ROD

UNA Welding & Bonding Co.

Cleveland, Ohio

PS HEATERS

*Car Heating and Ventilating*

—are no longer operating problems. We can show you how to take care of both with one equipment. The Peter Smith Forced Ventilation Hot Air Heater will save, in addition, 40% to 60% of the cost of any other car heating and ventilating system. Write for details.

The Peter Smith Heater Company

6209 Hamilton Ave., Detroit, Mich.

NORTHERN **BELL** WESTERN

**CEDAR POLES**

BUTT TREATING ALL GRADES TIES

BELL LUMBER CO., *Minneapolis, Minn.*

ANACONDA from mine to consumer

*Rod, Wire and Cable Products*

ANACONDA COPPER MINING COMPANY

THE AMERICAN BRASS COMPANY

General Offices - - 25 Broadway, New York

**ANACONDA TROLLEY WIRE**

**Coin Counting and Sorting Machines**

## FARE BOXES

Lever-Operated and Slip Change Carriers. Tokens.

**The Cleveland Fare Box Co.**

Cleveland, Ohio

Canadian Cleveland Fare Box Co., Ltd., Preston, Ont.



*Gets Every Fare*

PEREY TURNSTILES or PASSIMETERS

Use them in your Prepayment Areas and Street Cars

Perey Manufacturing Co., Inc.

101 Park Avenue, New York City

Your Name

in this space in all issues where larger display space is not used backs up your advertising campaign and keeps your name in the alphabetical index.



STUCKI SIDE BEARINGS

A. STUCKI CO.

Oliver Bldg.

Pittsburgh, Pa.

# SEARCHLIGHT SECTION

## USED EQUIPMENT & NEW—BUSINESS OPPORTUNITIES

UNDISPLAYED—RATE PER WORD:

*Positions Wanted*, 4 cents a word, minimum 75 cents an insertion, payable in advance.

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*Proposals*, 40 cents a line an insertion.

INFORMATION:

*Box Numbers* in care of any of our offices count 10 words additional in undisplayed ads.

*Discount* of 10% if one payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER INCH:

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8 to 14 inches..... 4.10 an inch

Rates for larger spaces, or yearly rates, on request.

*An advertising inch* is measured vertically on one column, 3 columns—30 inches—to a page.

R.J.

### POSITION WANTED

GENERAL executive, fifteen years' successful experience, construction, maintenance, operation, management; seeks connection with a future. PW-147, Electric Railway Journal, Tenth Ave. at 36th St., New York.

### SEARCHLIGHT SERVICE

*Covers the Advertising of*

Agencies Wanted
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Bids Wanted
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Buildings for Sale
Business Opportunities
Civil Service Opportunities
Contracts to Be Let
Contracts Wanted
Educational
Employment Agencies
Foreign Business
For Exchange
For Rent
Franchises
Industrial Sites
Labor Bureaus
Machinery Wanted
New Industries Wanted
Partners Wanted
Patent Attorneys
Patents for Sale
Plants for Sale
Positions Vacant
Positions Wanted
Property for Sale
Proposals
Receivers' Sales
Representatives Wanted
Salesmen Wanted
Second Hand Equipment
For Sale For Rent
Exchange Wanted
Specialties
Tutoring
Miscellaneous For Sale, For Rent and Wanted

*Address*

SEARCHLIGHT DEPT.
Tenth Ave. at 36th St., New York

### WE WANT TO BUY

1—Used Car Body only *(no trucks or equipment required)* for freight hauling purposes. Must be in good condition. Either wood or steel construction. Doors in center of car—45' maximum length.

### WE HAVE TO SELL

3—Standard Gauge Cincinnati Interurban Cars, 50' long, fully equipped.

7—Burney Cars, fully equipped; following additional equipment to be had separately:

Westinghouse K28 Controllers, No. 56 Ry. Motors complete with Gears and Pinions.

56—No. 101-B Armatures complete, Circuit Breakers KI0 Controllers, G. E. No. 1000 Ry. Motors complete with Gears and Pinions, K12 Controllers, G. E. Circuit Breakers.

Also large line of new repair parts for above equipment—never been used.

ALL EQUIPMENT IN EXCELLENT CONDITION AND CAN BE INSPECTED AT SHEBOYGAN OR OSHKOSH, WISCONSIN.

*Wire or write.*

THE WISCONSIN POWER & LIGHT COMPANY
000 Gay Bldg., Madison, Wis.

WANTED

5 Second Hand Birney Cars

in good operating condition. Trucks Brill 79-E, Westinghouse 508-A Motors, K-63 Br. Controllers, General Electric C. P. 25 Air Equipment.

SIOUX CITY SERVICE COMPANY,
524 Nebraska St., Sioux City, Iowa

*A change in an owner's requirements has put*

Several Slightly Used
Model 54, 1928

6-cylinder, 28-passenger

White Parlor Car Busses

in our Used Bus Department

*Write for full particulars*

THE WHITE CO.
2520 S. Wabash Ave., Chicago, Ill.

FOR SALE

12 Motor Freight Cars

Sprague G. E.—Type P. C. Multiple Unit Control. Combination Straight and Automatic Air Brake Equipment. G. E. Compressor—C. P. 28.

9 Trail Freight Cars

All Equipment in Good Shape

*For Particulars Apply*

Boston, Worcester and New York Street Railway Co.
Framingham, Mass.

*Somebody—Somewhere,*

can use the cars or equipment you want to sell!
Reach that buyer quickly and economically thru the

"SEARCHLIGHT SECTION"

*The weekly meeting place of Used Equipment Buyers and Sellers*

# WHAT AND WHERE TO BUY

**Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors Advertising in this Issue**

This index is published as a convenience to the reader. Every care is taken to make it accurate, but *Electric Railway Journal* assumes no responsibility for errors or omissions.

**Advertising, Street Car**
Collier, Inc., Barron G.

**Air Brakes**
General Electric Co.
Westinghouse Tr. Br. Co.

**Anchors, Guy**
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

**Armature Shop Tools**
Columbia Machine Works
Elec. Service Supplies Co.

**Automatic Return Switch Stands**
Ramapo Ajax Corp.

**Automatic Safety Switch Stands**
Ramapo Ajax Corp.

**Axles**
Bemis Car Truck Co.
Bethlehem Steel Co.
Brill Co., The J. G.
Cincinnati Car Co.
Westinghouse E. & M. Co.

**Babbitting Devices**
Columbia Machine Works

**Badges and Buttons**
Elec. Service Supplies Co.
International Reg. Co., The

**Barges, Coal**
American Bridge Co.

**Batteries, Dry**
Nichols-Lintern Co.

**Bearings and Bearing Metals**
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works
Westinghouse E. & M. Co.

**Bearings, Anti-Friction**
Timken Roller Bearing Co.

**Bearings, Center and Roller Side**
Cincinnati Car Co.
Columbia Machine Works
Stucki Co., A.

**Bearings, Roller**
Timken Roller Bearing Co.

**Bearings, Thrust**
Timken Roller Bearing Co.

**Bells and Buzzers**
Consolidated Car Htg. Co.

**Bells and Gongs**
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works
Elec. Service Supplies Co.

**Benders, Rail**
Railway Trackwork Co.

**Bodies, Bus**
Brill Co. The J. G.

**Body Material, Haskelite & Plymetl**
Haskelite Mfg. Co.

**Bolts, Case Hardened**
American Steel Foundries
Bemis Car Truck Co.

**Bond Testers**
American Steel & Wire Co.
Electric Service Supplies Co.

**Bonding Apparatus**
American Steel & Wire Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.

**Bonds, Rail**
American Steel & Wire Co
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.
Westinghouse E. & M. Co.

**Books**
McGraw-Hill Book Co.

**Brackets and Cross Arms (See also Poles, Ties, Posts, etc.)**
American Bridge Co.
Columbia Machine Works
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.

**Brake Adjusters**
American Steel Foundries
Brill Co., The J. G.
Cincinnati Car Co.
National Ry. Appliance Co.
Westinghouse Tr. Br. Co.

**Brake Shoes**
American Brake Shoe
Bemis Car Truck Co.
Brill Co., The J. G.

**Brake Testers**
National Ry. Appliance Co.

**Brakes, Brake Systems and Brake Parts**
American Steel Foundries
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works
General Electric Co.
National Brake Co.
Safety Car Devices Co.
Westinghouse Tr. Br. Co.

**Brakes, Magnetic Rail**
Cincinnati Car Co.

**Bridges, Steel**
American Bridge Co.

**Brushes, Carbon**
General Electric Co.
Morganite Brush Co., Inc.
Westinghouse E. & M. Co.

**Brushes, Graphite**
Morganite Brush Co., Inc.

**Brushholders**
Columbia Machine Works
General Electric Co.

**Buildings, Steel**
American Bridge Co.

**Bulkheads**
Haskelite Mfg. Co.

**Bunkers, Coal**
American Bridge Co.

**Buses**
Studebaker Corp. of America
Versare Corp.

**Buses, Motor**
General Electric Co.
General Motors Truck Co.

**Bus Lighting**
National Ry. Appliance Co.

**Bushings, Case Hardened and Manganese**
American Steel Foundries
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works

**Cables (See Wires and Cables)**

**Cambric Tapes, Yellow and Black Varnish**
General Electric Co.
Irvington Varn'h & Ins. Co.

**Carbon Brushes (See Brushes, Carbon)**

**Car Lighting Fixtures**
Elec. Service Supplies Co.

**Car Panel Safety Switches**
Consolidated Car Htg. Co.
Westinghouse E. & M. Co.

**Car Steps, Safety**
Cincinnati Car Co.

**Car Wheels, Rolled Steel**
Bethlehem Steel Co.

**Cars, Dump**
Brill Co., The J. G.
Differential Steel Car Co.

**Cars, Gas-Electric**
Brill Co., The J. G.
General Electric Co.
Westinghouse E. & M. Co.

**Cars, Gas, Rail**
Brill Co., The J. G.

**Cars, Passenger, Freight, Express, etc.**
American Car Co.
Brill Co., The J. G.
Cincinnati Car Co.
Kuhlman Car Co., G. C.
Wason Mfg. Co.

**Cars, Self-Propelled**
Brill Co., The J. G.

**Castings, Brass Composition or Copper**
Cincinnati Car Co.
Columbia Machine Works

**Castings, Gray Iron and Steel**
American Brake Shoe
American Bridge Co.
American Steel Foundries
Bemis Car Truck Co.
Columbia Machine Works
Standard Steel Works

**Castings, Malleable & Brass**
American Brake Shoe
Bemis Car Truck Co.
Columbia Machine Works
Timken Roller Bearing Co.

**Catchers and Retrievers, Trolley**
Elec. Service Supplies Co.
Ohio Brass Co.

**Ceiling, Car**
Haskelite Mfg. Co.

**Ceilings, Plywood Panels**
Haskelite Mfg. Co.

**Chairs, Parlor Car**
Heywood-Wakefield Co.

**Change Carriers**
Cleveland Fare Box Co.
Electric Service Supplies Co.

**Change Trays**
Cincinnati Car Co.

**Circuit-Breakers**
General Electric Co.
Westinghouse E. & M. Co.

**Clamps and Connectors for Wires and Cables**
Columbia Machine Works
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

**Cleaners**
Oakite Prod., Inc.

**Cleaners and Scrapers, Track (See also Snow-Plows, Sweepers and Brooms)**
Brill Co., The J. G.
Cincinnati Car Co.

**Coil Banding and Winding Machines**
Columbia Machine Works
Elec. Service Supplies Co.
Westinghouse E. & M. Co.

**Coils, Armature and Field**
Columbia Machine Works
General Electric Co.
Westinghouse E. & M. Co.

**Coils, Coke and Kicking**
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.

**Coin Changers**
Johnson Fare Box Co.

**Coin Counting Machines**
Cleveland Fare Box Co.
International Reg. Co., The
Johnson Fare Box Co.

**Coin Sorting Machines**
Cleveland Fare Box Co.
Johnson Fare Box Co.

**Coin Wrappers**
Cleveland Fare Box Co.

**Commutator Slotters**
Columbia Machine Works
Elec. Service Supplies Co.
Westinghouse E. & M. Co.

**Commutators or Parts**
Columbia Machine Works
General Electric Co.
Westinghouse E. & M. Co.

**Compressors, Air**
General Electric Co.
Westinghouse Tr. Br. Co.

**Condensers**
General Electric Co.
Westinghouse E. & M. Co.

**Condensor Papers**
Irvington Varn'h & Ins. Co.

**Connectors, Solderless**
Westinghouse E. & M. Co.

**Connectors, Trailer Car**
Columbia Machine Works
Consolidated Car Htg. Co.
Elec. Service Supplies Co.
Ohio Brass Co.

**Controllers or Parts**
Columbia Machine Works
General Electric Co.
Westinghouse E. & M. Co.

**Controller Regulators**
Elec. Service Supplies Co.

**Controlling Systems**
General Electric Co.
Westinghouse E. & M. Co.

**Converters, Rotary**
General Electric Co.
Westinghouse E. & M. Co.

**Conveying & Hoisting Machinery**
American Bridge Co.

**Copper Wire**
American Brass Co.
Anaconda Copper Mining Co.

**Copper Wire Instruments, Measuring, Testing and Recording**
American Brass Co.
Anaconda Copper Mining Co.

**Cord, Bell, Trolley, Register**
American Steel & Wire Co.
Brill Co., The J. G.
Elec. Service Supplies Co.
International Reg. Co., The
Roebling's Sons Co., John A.
Silver Lake Co.

**Cord Connectors and Couplers**
Elec. Service Supplies Co.

**Couplers, Car**
American Steel Foundries
Brill Co., The J. G.
Cincinnati Car Co.
Ohio Brass Co.
Westinghouse Tr. Br. Co.

**Cowl Ventilators**
Nichols-Lintern Co.

**Cranes, Hoists & Lifts**
Electric Service Supplies Co

**Cross Arms (See Brackets)**

**Crossings**
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

**Crossings, Frogs & Switches**
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

**Crossings, Manganese**
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

**Crossings, Track (See Track Special Work)**

**Crossings, Trolley**
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

**Curtains & Curtain Fixtures**
Brill Co., The J. G.
Edwards & Co., O. M.

**Cutting Apparatus**
General Electric Co.
Railway Trackwork Co.
Una Welding & Bonding Co.
Westinghouse Tr. Br. Co.

**Dealer's Machinery & Second Hand Equipment**
Boston, Worcester & New York R'l'w'y Co.
Sioux City Service Co.
White Co., The
Wisconsin Power & Light Co.

**Derailing Devices (See also Track Work)**

**Derailing Switches**
Ramapo Ajax Corp.

**Destination Signs**
Columbia Machine Works
Elec. Service Supplies Co.

**Detective Service**
Wish-Service, P. Edward

**Door Operating Devices**
Brill Co., The J. G.
Cincinnati Car Co.
Consolidated Car Heating Co.
National Pneumatic Co.
Safety Car Devices Co.

**Doors, Folding Vestibule**
National Pneumatic Co.
Safety Car Devices Co.

**Doors & Door Fixtures**
Brill Co., The J. G.
Cincinnati Car Co.
Edwards & Co., O. M.
Hale-Kilburn Co.

**Drills, Track**
American Steel & Wire Co.
Electric Service Supplies Co.
Ohio Brass Co.

**Drum Truing Lathes**
Nat'l Rlwy. Appliance Co

**Dryers, Sand**
Electric Service Supplies Co
Westinghouse E. & M. Co

**Ears**
Columbia Machine Works
Electric Service Supplies Co
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

**Electric Grinders**
Railway Trackwork Co.

**Electric Transmission Towers**
American Bridge Co.

**Electrical Wires and Cables**
American Steel & Wire Co.
John A. Roebling's Sons Co

**Electrodes, Carbon**
Railway Trackwork Co.
Una Welding & Bonding Co.

**Electrodes, Steel**
Railway Trackwork Co.
Una Welding & Bonding Co.

**Engineers, Consulting, Contracting and Operating**
Beeler, John A.
Buchanan & Layng Corp.
Byllesby Co., H. M.
Faile & Co., E. H.
Ford, Bacon & Davis
Hemphill & Wells
Holst, Engelhardt W.
Jackson, Walter
Kelker & DeLeuw
McClellan & Junkersfeld
Richey, Albert S.
Sanderson & Porter
Scarr Transport Service, Inc.
Stevens & Wood
Stone & Webster Co.
White Eng. Corp., The J. G.

**Engines, Gas, Oil or Steam**
Westinghouse E. & M. Co.

**Exterior Side Panels**
Haskelite Mfg. Co.

**Fare Boxes**
Cleveland Fare Box Co.
Johnson Fare Box Co.
Nat'l Rlwy. Appliance Co.
Ohmer Fare Register Co.
Perey Mfg. Co.

**Fare Registers**
Electric Service Supplies Co.
Johnson Fare Box Co.
Ohmer Fare Register Co.

**Fences, Woven Wire & Fence Posts**
American Steel & Wire Co.

**Fenders and Wheel Guards**
Brill Co., The J. G.
Cincinnati Car Co.
Star Brass Works

**Fibre and Fibre Tubing**
Westinghouse E. & M. Co.

**Field Coils (See Coils)**

**Floodlights**
Electric Service Supplies Co.
General Electric Co.

**Floor, Sub**
Haskelite Mfg. Co.

**Floors**
Haskelite Mfg. Co.

**Forgings**
American Steel Foundries
Brill Co., The J. G.
Cincinnati Car Co.
Standard Steel Works Co.

**Frogs & Crossings, Tee Rail**
Bethlehem Steel Co.
Lorain Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

**Frogs, Track (See Track Work)**

**Frogs, Trolley**
Electric Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

**Furnaces, Electric, Steel Melting**
American Bridge Co.

**Fuses and Fuse Boxes**
Columbia Machine Works
Consolidated Car Htg. Co.
General Electric Co.
Westinghouse E. & M. Co.

**Gas Electric Drive for Buses**
General Electric Co.
Nat'l Rlwy. Appliance Co.

**Gas Producers**
Westinghouse E. & M. Co.

**Gates, Car**
Brill Co. The J. G.
Cincinnati Car Co.

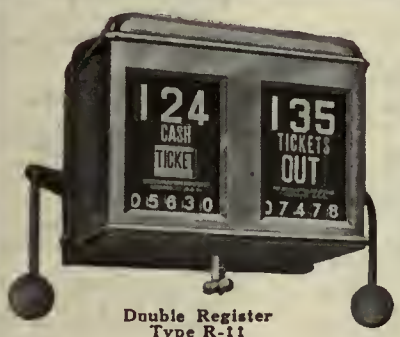
**Gear Blanks**
Brill Co., The J. G.
Standard Steel Works Co.

Continued on page 44

## *Tisco Manganese Steel*
## Special Trackwork
*For*
## Subway, Elevated and Surface Lines

**WM. WHARTON JR. & CO., Inc.**
*EASTON, PA.*

SALES OFFICES
Boston Chicago El Paso Montreal New York
Philadelphia Pittsburgh San Francisco Scranton



Double Register
Type R-11

## International Registers

Made in single and double types to meet requirements of service. For hand or foot, mechanical or electric operation. Counters, car fittings, conductors' punches.

**The International Register Co.**
15 South Throop Street, Chicago, Illinois

# COLUMBIA

## Railway and Utility Supplies

Castings—Grey Iron, Brass and Aluminum

Forgings
Special Machinery and Patterns

Machine and Sheet Metal Work

Armature and Field Coils.

*The* Columbia Machine Works *and M. I. Co.*
265 Chestnut St., corner Atlantic Ave.,
Brooklyn, New York

B. A. HEGEMAN, Jr. President H. A. HEGEMAN, First Vice-Pres. and Treas.
F. T. SARGENT, Secretary J. M. PRATT, Vice-Pres. in charge of sales

## National Railway Appliance Co.

Graybar Building, 420 Lexington Ave., New York

BRANCH OFFICES
Munsey Bldg., Washington, D. C. 100 Boylston St., Boston, Mass.
Hegeman-Castle Corporation, Railway Exchange Building, Chicago, Ill.
F. F. Bodler, 903 Monadnock Bldg., San Francisco, Calif.
Lister-Reese Inc., 401 S. Brand Blvd., Glendale, Calif.

RAILWAY SUPPLIES

Houdaille Shock Absorber.
Tool Steel Gears and Pinions
Anglo-American Varnish Co., Varnishes, Enamels, etc.
National Hand Holds
Genesco Paint Oils
Dunham Hopper Door Device
Garland Ventilators
Walter Tractor Snow Fighters
Feasible Drop Brake Stands
Ft. Pitt Spring & Mfg. Co., Springs
Bell Register Fare Boxes
Fraser Gas Electric Drive
Flaxlinum Insulation
Economy Electric Devices Co. Power Saving and Inspection Meters
National Safety Devices Company's Whistle Blowers, Gong Ringers and Brake Hangers
Godward Gas Generators
Cowdrey Automotive Brake Testing Machine
Tru-Drum Lathe

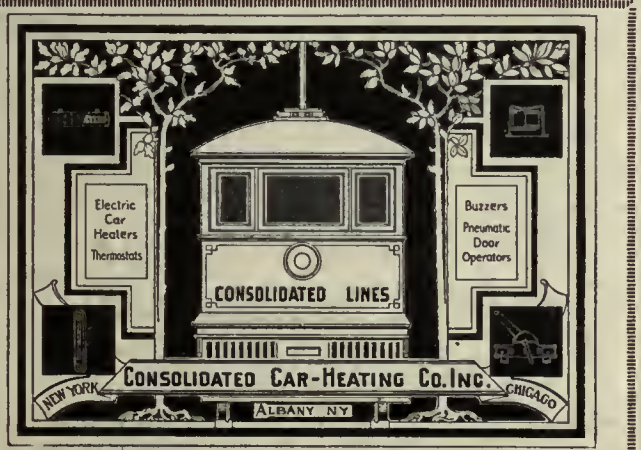
## Bethlehem Products for Electric Railways

Tee and Girder Rails; Machine Fitted Joints; Splice Bars; Hard Center Frogs; Hard Center Mates; Rolled Alloy Steel Crossings; Abbott and Center Rib Base Plates; Rolled Steel Wheels and Forged Axles; Tie Rods; Bolts; Tie Plates and Pole Line Material.

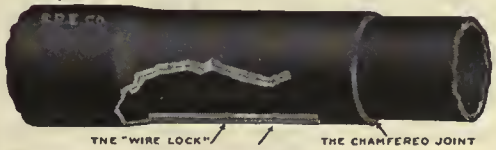
*Catalog Sent on Request*

BETHLEHEM STEEL COMPANY, Bethlehem, Pa.

# BETHLEHEM




## ELRECO TUBULAR POLES




COMBINE

Lowest Cost Lightest Weight
Least Maintenance Greatest Adaptability

Catalog complete with engineering data sent on request.

ELECTRIC RAILWAY EQUIPMENT CO.
CINCINNATI, OHIO
New York City, 30 Church Street

**Gear Cases**
Columbia Machine Works
Electric Service Supplies Co.
Westinghouse E. & M. Co.

**Gears and Pinions**
Bemis Car Truck Co.
Columbia Machine Works
Electric Service Supplies Co.
General Electric Co.
Nat'l Ry. Appliance Co.
Nuttall & Co., R. D.
Westinghouse-Nuttall

**Generators**
General Electric Co.
Westinghouse E. & M. Co.

**Girder Rails**
Bethlehem Steel Co.
Lorain Steel Co.

**Gongs (See Bells and Gongs)**

**Grinders, Portable**
Railway Trackwork Co.

**Grinders, Portable Electric**
Railway Trackwork Co.

**Grinding Bricks and Wheels**
Railway Trackwork Co.

**Guard Rail Clamps**
Lorain Steel Co.
Ramapo Ajax Corp.

**Guard Rails, Tee Rail & Manganese**
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

**Guards, Trolley**
Elec. Service Supplies Co.
Ohio Brass Co.

**Harps, Trolley**
Columbia Machine Works
Elec. Service Supplies Co.
Nuttall & Co., R. D.
Ohio Brass Co.
Star Brass Works
Westinghouse-Nuttall

**Headlights**
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.

**Headlining**
Columbia Machine Works
Haskelite Mfg. Co.

**Heaters, Car (Electric)**
Consolidated Car Heating Co.
Gold Car Heat. & Ltg. Co.
Railway Utility Co.
Smith Heater Co., Peter

**Heaters, Car, Hot Air and Water**
Smith Heater Co., Peter

**Heaters, Car Stove**
Smith Heater Co., Peter

**Helmets, Welding**
Railway Trackwork Co.
Una Welding & Bonding Co.

**Hoists & Lifts**
Columbia Machine Works

**Hoists, Portable**
Sullivan Machinery Co.

**Hose, Bridges**
Ohio Brass Co.

**Hose, Pneumatic**
Westinghouse Tr. Brake Co.

**Instruments, Measuring, Testing and Recording**
American Steel & Wire Co.
General Electric Co.
National Ry. Appliance Co.
Westinghouse E. & M. Co.

**Insulating Cloth, Paper and Tape**
General Electric Co.
Irvington Varn'h & Ins. Co.
Okonite Co.
Okonite-Callender Cable Co.
Westinghouse E. & M. Co.

**Insulating Silk**
Irvington Varn'h & Ins. Co.

**Insulating Varnishes**
Irvington Varnish & Ins. Co.

**Insulation (See also Paints)**
Electric Ry. Equipment Co.
Elec. Service Supplies Co.
Irvington Varn'h & Ins. Co.
Okonite Co.
Okonite-Callender Cable Co.
Westinghouse E. & M. Co.

**Insulation Slots**
Irvington Varn'h & Ins. Co.

**Insulator Pins**
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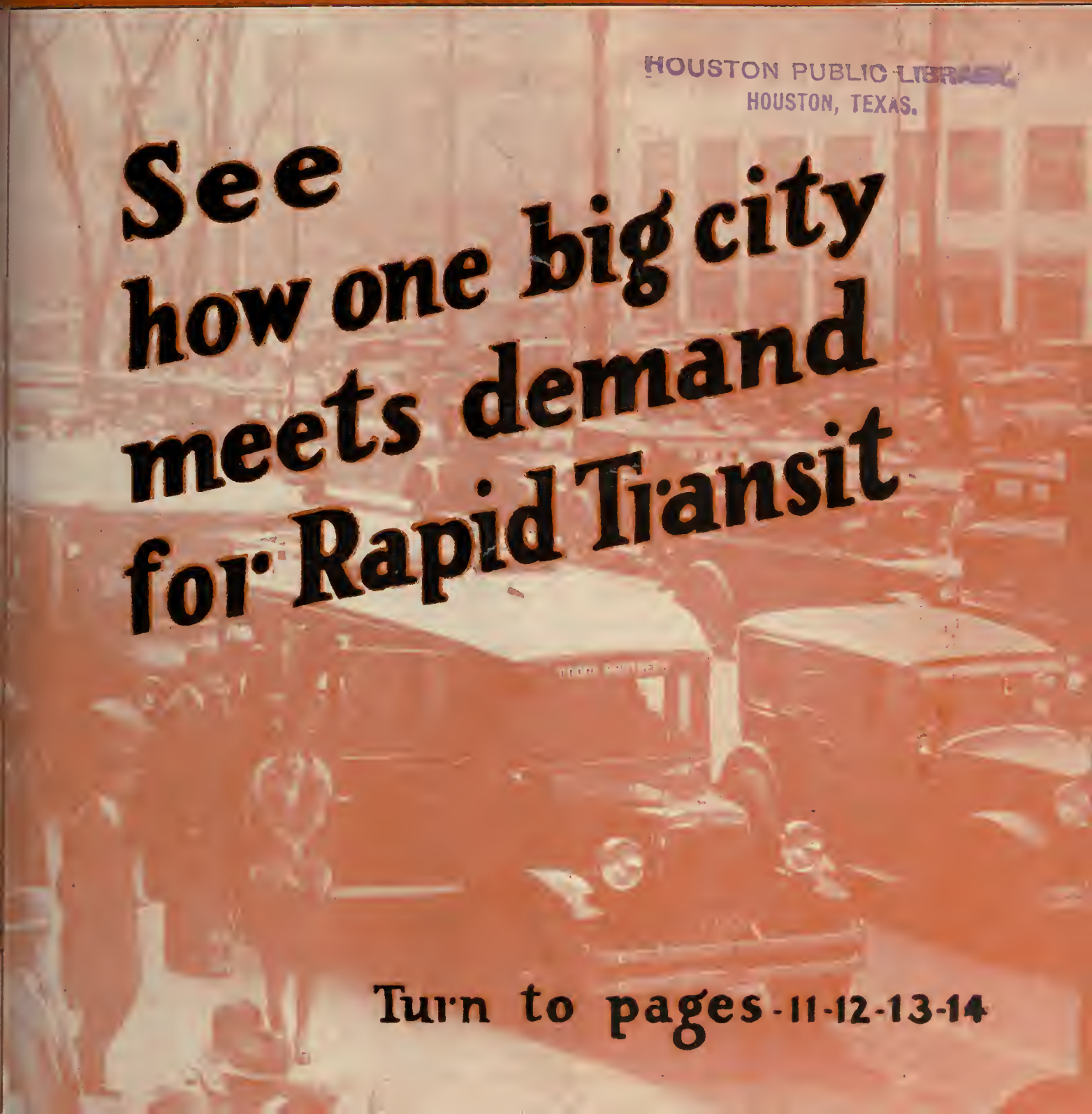
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Chemical and Metallurgical Engineering
Bus Transportation
Power
Coal Age
Radio Retailing
Engineering News-Record
Ingeniería Internacional
Construction Methods
Food Industries
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1928

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December 1, 1928

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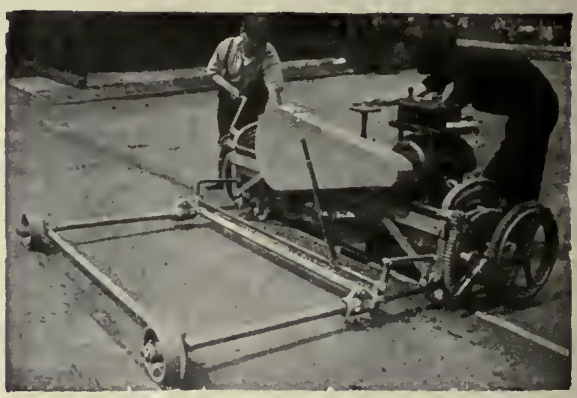
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2866



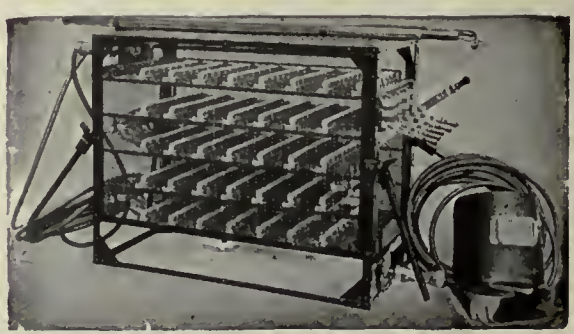
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# The Internal Copper Sleeve

THE longer service life of O-B Rail Bonds is due in no small degree to the internal copper sleeve, a feature which has long been successfully employed in O-B bond construction.

The internal copper sleeve construction is directly responsible for the remarkably low percentage of strand breakage in O-B Bonds, as compared to the old practice where the internal sleeve was not used.

The illustrations above show why this is true. Hold a piece of wire in a pair of pliers. Bend it back and forth until it breaks. Then hold the wire between the thumb and finger and repeat the experiment. The latter method requires from three to four times as many bends, because of the cushioning effect of the thumb and finger.

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**The O-B Titon Bond**

One of the many types of O-B Rail Bonds with the internal copper sleeve.

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PORCELAIN INSULATORS
LINE MATERIALS
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# *Modern Cars in Modern Conditions Need Modern Brakes*

Comfortable cars . . . attractive cars . . . convenient cars . . . speedy cars—these are what the modern street railway needs—these are what the up-to-date railway operating official is providing for his patrons.

Modern brakes are making a worthwhile contribution toward improved transportation conditions.

The Westinghouse Variable Load Brake automatically adjusts brake cylinder pressure as car weight changes — permitting maximum retarding rate throughout range of passenger loading. The results are Greater Safety . . . Fewer Delays . . . Faster Schedules.

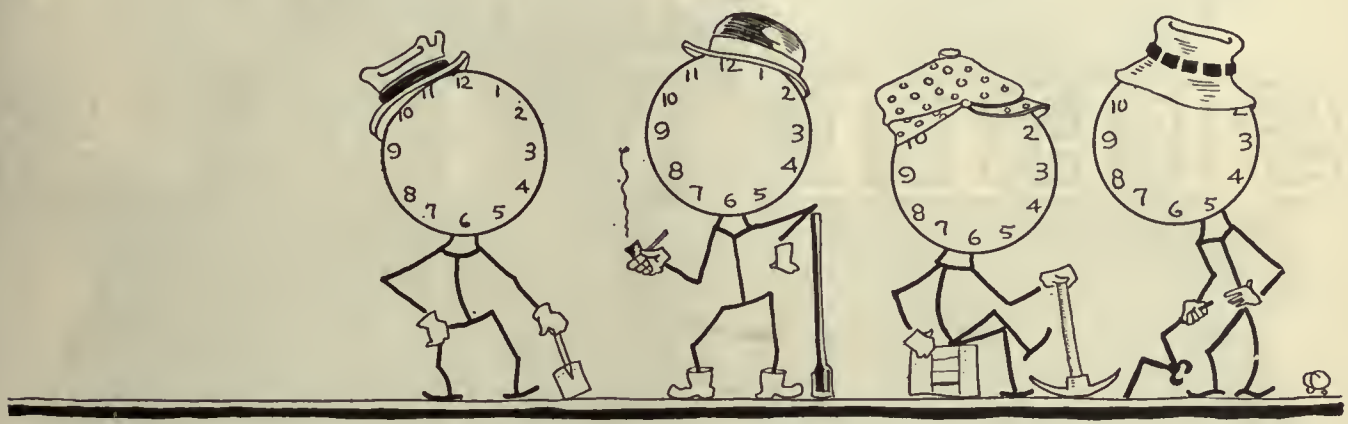
*The modern brake for modern cars is the Westinghouse Variable Load Brake.*

WESTINGHOUSE TRACTION BRAKE CO.
General Office and Works, Wilmerding, Pa.

# WESTINGHOUSE TRACTION BRAKES

# Each "Man-Hour" Is 5.2 Fares!

**Introducing "Man-hours" and the beginning of the "Man-hour" series**



**A "Man-Hour" is an interesting unit!**

**He represents cash, as the simple product of units of time by the cost of an hour's wage.**

**In any business he is a factor in profits; particularly where the unit sale is small.**

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**CLEVELAND, OHIO**

# STEEL TWIN TIE TRACK
## THE BASE OF MODERNIZATION

# DAVIS

## "ONE-WEAR"

# STEEL WHEELS




## AMERICAN STEEL FOUNDRIES

NEW YORK CHICAGO ST. LOUIS



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Dome type lighting fixtures add greatly to the interior appearance and comfort of electric railway cars.

They consume little current and provide perfect diffusion of light without glare or eyestrain. They practically eliminate lamp pilfering.

The bowls are made of light density opal glass with statuary bronze finish on the fixtures although special finishes can be supplied to order.

Pressed steel with pressed glass of sufficient thickness make Dome type fixtures stand up under the extreme vibration of transportation conditions. They permit the use of larger lamps with consequent reduction in cost of lamp renewals, longer lamp life and simplified wiring.

Three standard sizes to select from—accommodating 12, 10 or 8-in. glassware. Arrange to look over this line.

Home office and plant at 17th & Cambria Sts., PHILADELPHIA; District office at 111 N. Canal St., CHICAGO; 50 Church St., NEW YORK; Bessemer Bldg., Pittsburgh; 88 Broad St., Boston; General Motors Bldg., Detroit; 316 N. Washington Ave., Scranton; Canadian Agents, Lyman Tube & Supply Company, Ltd., Montreal, Toronto, Vancouver.





For use in conjunction with the new "20" series Lighting System

# ELECTRIC SERVICE SUPPLIES CO.

MANUFACTURER OF RAILWAY, POWER AND INDUSTRIAL ELECTRICAL MATERIAL

# SCIENTIFIC TREATMENT





THOUSANDS of *International* Poles still sound after 20 to 30 years' service in line are the best evidence that *International* treatment is thorough and effective. The deep penetration that is obtained by this company with the Rueping Empty Cell Process or the Bethel Full Cell Process protects the wood despite abrasions and season checks.

Treating operations are carried on at *International* plants by engineers who have made a life study of timber and its treatment. All technical observations, such as creosote analyses, moisture determinations, and depth of penetration are made by graduate chemical engineers.

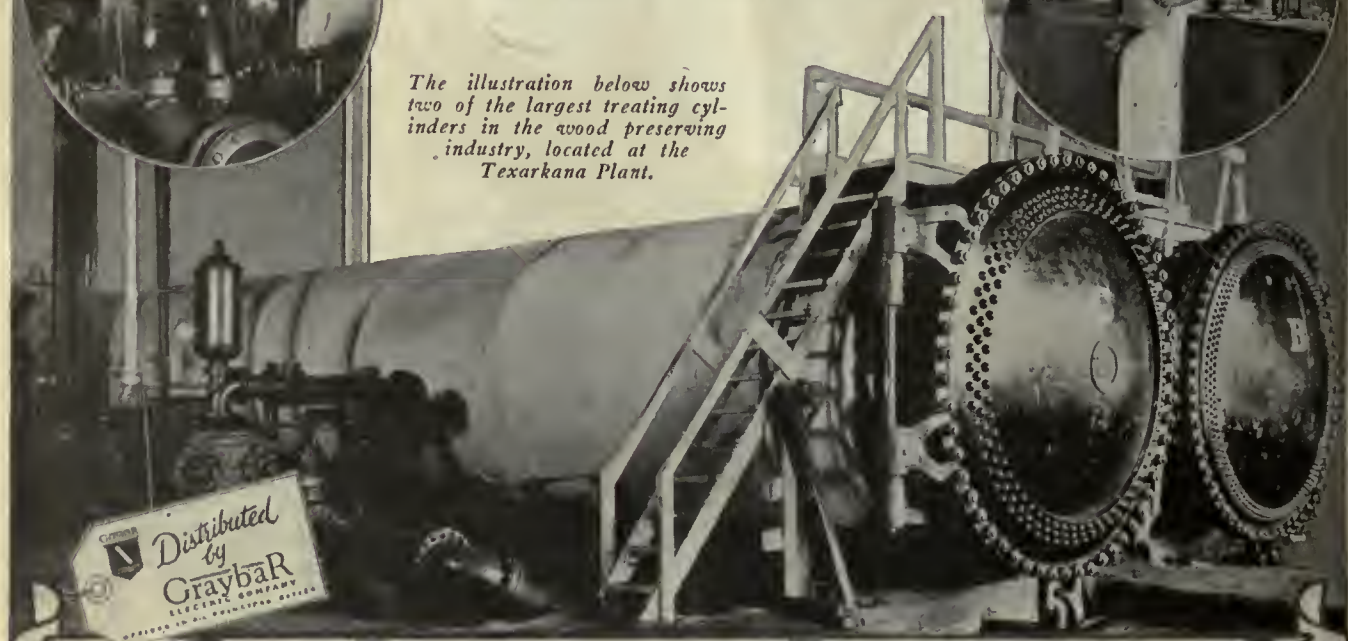
The plants are equipped throughout with indicating gauges to insure accuracy in the control of temperatures, steam pressures, vacuum and the injection of preservative. Supplementing these gauges is a complete set of self-recording gauges which furnish a continuous record of every step. These charts give a permanent autographic story of each charge of *International* Poles.

**International Creosoting & Construction Co.**
General Offices—Galveston, Texas
Plants: Beaumont Texarkana Galveston



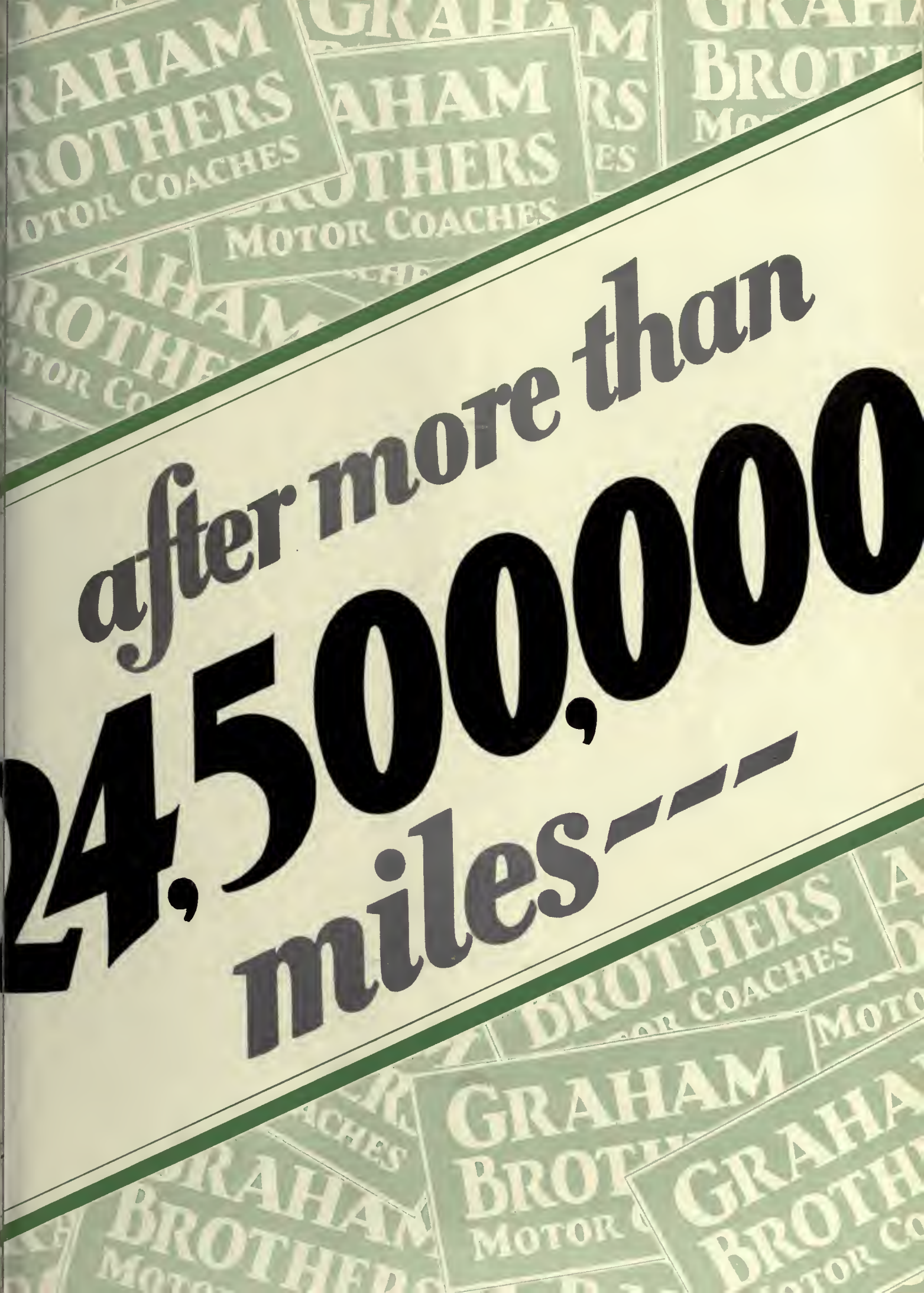


*The illustration below shows two of the largest treating cylinders in the wood preserving industry, located at the Texarkana Plant.*



Distributed by Graybar Electric Company

# International Creosoted Yellow Pine Poles


after more than
24,500,000
miles---

# DETROIT *buys*



On Woodward Avenue at Grand Circus—Six-cylinder engine and 4-speed transmission get the coach away quickly and smoothly

Snapped in Detroit's shopping center—The beauty of the coach appeals to women



Interior is clean, roomy, light and well ventilated—Clear vision for the driver—Safety and Comfort for passengers





Traffic like this requires coaches with speed, snap, ease of handling and certainty of control—Grahams meet these requirements

# 120 *more*

# GRAHAM BROTHERS

## MOTOR COACHES



At one of the stops on the Woodward Avenue route—Detroit's Art Center



*Two of the veterans that contributed to the 24,500,000 miles*

# Detroit Buys 120 More Because . . .

Detroit had previously purchased 200 Graham Brothers Motor Coaches over a period of four years—

Detroit had operated the 200 coaches more than 24,500,000 miles at low cost—

Detroit had furnished rapid, safe, comfortable transportation to more than 100,000,000 passengers in the 200 coaches—

Detroit knew the vast manufacturing facilities and resources of Dodge Brothers—and knew it could depend with confidence on no other manufacturer for delivery of so large an order as 120 coaches in the brief time necessary.

# GRAHAM BROTHERS MOTOR COACHES

BUILT BY MOTOR COACH DIVISION OF DODGE BROTHERS

PRINTED IN U.S.A.

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CONSTANTLY PROGRESSING!

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ECONOMIZE

PNEUMATIZE

MODERNIZE

*and now it's*

TREADLE-IZE!

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*General Works:* Rahway, New Jersey

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MANUFACTURED IN TORONTO, CANADA, BY
Railway & Power Engineering Corp., Ltd.

PHILADELPHIA
1010 Colonial Trust Building




# IN FAST INTERURBAN SERVICE—

## *How about your wheels?*

Standard Wheels carry hundreds of thousands of passengers to the cities and back again every day. The speeds and quick stops necessary to maintain competitive schedules put unusual tax on wheel stamina.

Standard Wheels hold up!



*"FOR EVERY TYPE OF CAR*

*IN EVERY TYPE OF SERVICE"*

**STANDARD STEEL WORKS COMPANY**

**PHILADELPHIA, PA.**

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ST. LOUIS HOUSTON RICHMOND ST. PAUL MEXICO CITY

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# *Moves 3000 cubic yards of snow per hour—*

—and only two men needed to operate the machine plus one to direct movements on the street.

The Fox Snow Loader is without question the most effective machine for removing snow from streets and roads either by loading piled up snow on trucks or by casting it off the road.

Its capacity for loading is limited only by the speed and regularity with which the trucks can be moved up and moved away. Loading a five-yard truck in less than 30 seconds is common practice. And its cost of operation is found to *be less than 2c. per cubic yard.*

Outfit is equipped with a well-built cab, built to house one man against elements and enclosing all apparatus.

# FOX SNOW LOADER

FEATURES

Made of Steel throughout.
Equipped with Hyatt-Roller Bearings.
Escalator can be raised or lowered automatically in 10 seconds.
Travels from ½ mile to 15 miles per hour.
Maximum capacity 100 cubic yards per minute.
Trucks can load from either side or rear.

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CHESTER F. GAILOR, Inc.

*Sales Representative* 50 Church St., New York, N. Y.

# Heralding a year of activity and progress

## *The* ANNUAL STATISTICAL ISSUE

of

## Electric Railway Journal

## *January 12, 1929*

This important issue is being awaited with even greater interest than usual. It will chronicle the achievements of a year that has seen encouraging progress. And it will forecast an increasingly optimistic picture for 1929.

The contents of the issue will include the basic statistics for 1928; a complete picture of the Industry's budgets for 1929; high spots of the year's progress in financing, construction, operation and maintenance, and a review of the advances made by manufacturers.

The advertising pages will, as usual, form an important new year exhibit of the latest in equipment, materials and supplies.

## Advertising forms close JANUARY 2nd



# Your platform men

YOU operators—you take pride in the service you are rendering—you would discharge a platform man in a minute who came to work in overalls and was insulting to your passengers.

* * *

Do your *cars* insult your passengers?

Do your *cars* give the impression of "wearing overalls"?

* * *

An old fashioned, squeaky, rattling, slow going car, not only looks bad—it *is* bad. It's out of place—out of date—and like most old fashioned machines it costs *more money* to run than it would cost to *buy and run* a new car!

Cincinnati cars are as modern as tomorrow, as inviting as a Pullman. They "get away" fast—run smoothly—come to quick, smooth stops in an instant. They look well—create an atmosphere of *the best* wherever they run.

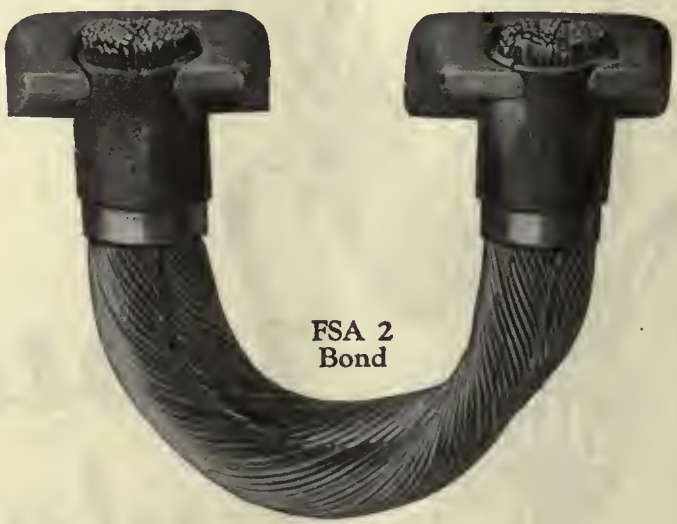
The earnings of your property depend on constant, increasing patronage. Today you build for the future. That's why you need Cincinnati Cars *now.*

CINCINNATI CAR COMPANY
CINCINNATI, OHIO

**CINCINNATI BALANCED LIGHTWEIGHT CARS**

*—still a step ahead of the modern trend.*

# American Steel and Wire Company



FSA 2
Bond



FSC
Bond

## *Reliable Performance with Simplicity of Application*

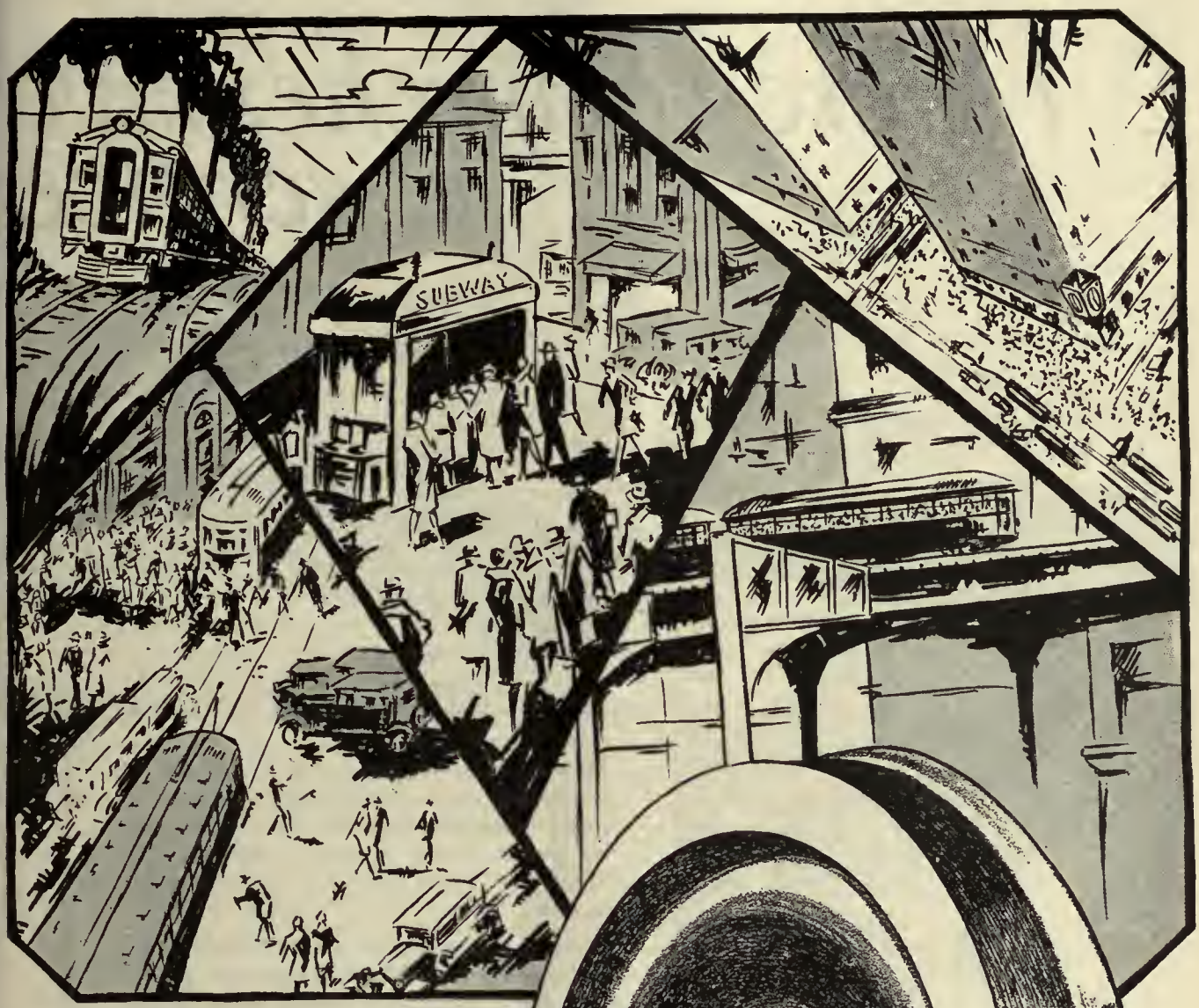
Here are two of the best all 'round welded bonds on the market. The terminals are designed to fit the rail joints and are easy to apply. The simplicity of application with our alloy flux wire combined with the ease with which the oxy-acetylene flame can be manipulated insures efficient and lasting attachment of these Flameweld Bonds.

Our engineers are ready at all times to assist you. Samples and literature gladly furnished on request.

SALES OFFICES:

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DETROIT, Foot of First Street
CINCINNATI, Union Trust Bldg.
MINNEAPOLIS—ST. PAUL, Merchants Nat'l Bk. Bldg., St. Paul
ST. LOUIS...506 Olive Street
KANSAS CITY, 417 Grand Avenue
OKLAHOMA CITY, First National Bank Bldg.
BIRMINGHAM, Brown-Marx Bldg.
MEMPHIS, Union and Planters Bank Bldg.
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PITTSBURGH.....Frick Bldg.
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BUFFALO..670 Ellicott Street
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DALLAS.....Praetorian Bldg.
DENVER, First National Bank Bldg.
SALT LAKE CITY, [illegible] Walker Bk. Bldg.

*San Francisco *Los Angeles *Portland *Seattle *United States Steel Products Co.

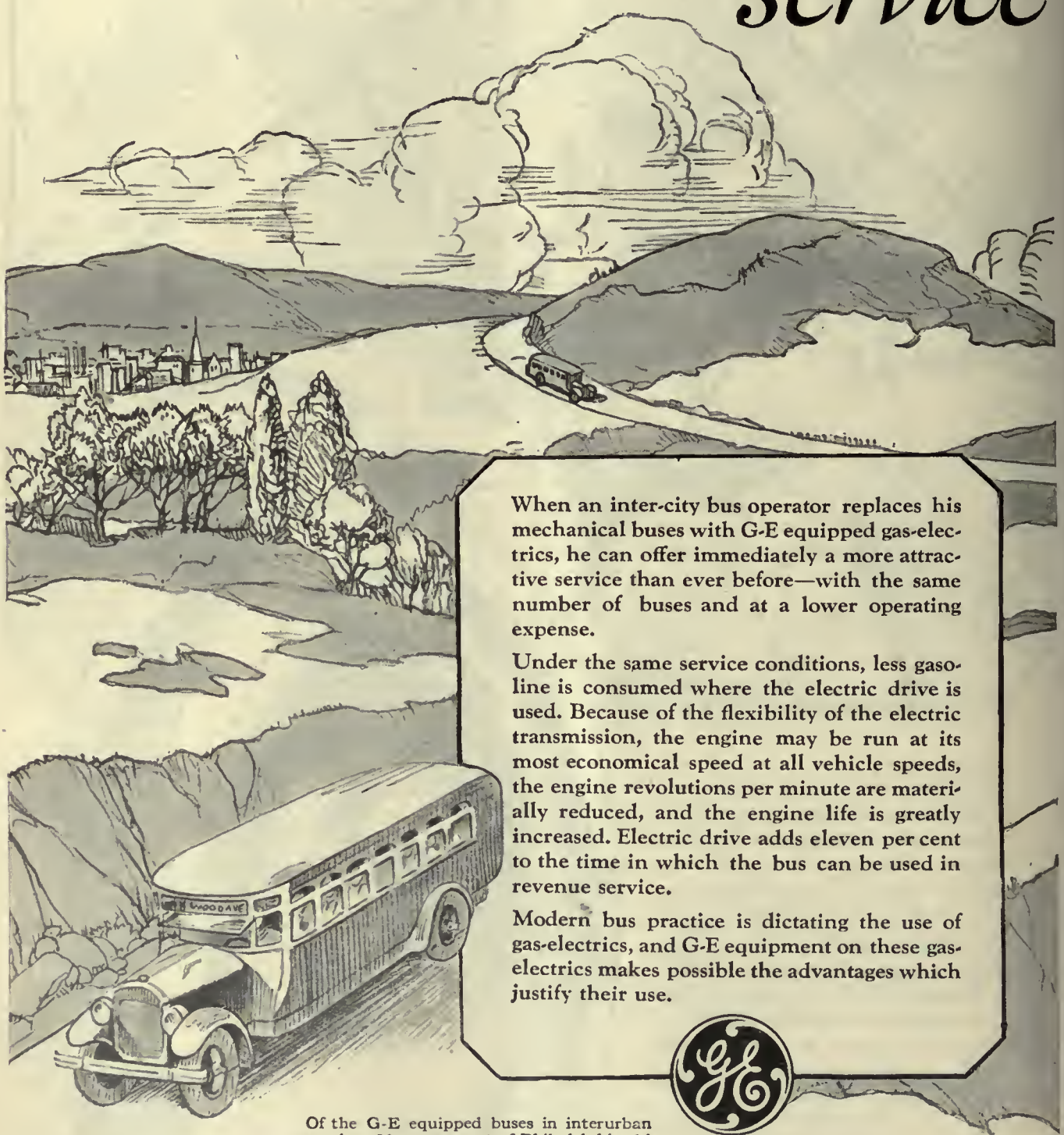



From wheel blank to finished product, the Gary Wrought Steel Wheel is made by men who know the importance of the task that the electric railways perform each day, and the need for dependable quipment in performing it.

Carefully selected ore is converted into high grade steel. This, in turn, is converted by a process of rolling and forging into a wheel that can be depended upon to carry its load week after week and month after month with a minimum of attention. . . . . A carefully worked out inspection system is your assurance of a perfect product.

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Under the same service conditions, less gasoline is consumed where the electric drive is used. Because of the flexibility of the electric transmission, the engine may be run at its most economical speed at all vehicle speeds, the engine revolutions per minute are materially reduced, and the engine life is greatly increased. Electric drive adds eleven per cent to the time in which the bus can be used in revenue service.

Modern bus practice is dictating the use of gas-electrics, and G-E equipment on these gas-electrics makes possible the advantages which justify their use.

Of the G-E equipped buses in interurban service, 80 operate out of Philadelphia, 14 out of Buffalo, and 75 out of Newark and New York.

390-34

**GENERAL ELECTRIC**

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

# Electric Railway Journal

*Consolidation of*
*Street Railway Journal and Electric Railway Review*

McGraw-Hill Publishing Company, Inc.
James H. McGraw, *Chairman of the Board*
Malcolm Muir, *President*
H. C. Parmelee, *Editorial Director*

CHARLES GORDON, *Editor*

Louis F. Stoll,
*Publishing Director*

*Volume 72* New York, Saturday, December 1, 1928 *Number 22*

## A Municipal Ownership Fiasco

SOMETHING is wrong with Seattle's Municipal Railway. Something has been wrong with it ever since the city took over the lines of the Puget Sound Traction, Light & Power Company on March 31, 1919, paying for it in twenty-year bonds bearing 5 per cent interest. Instead of taking the utility out of politics the transfer from the private company put the property into the center of that hazardous arena. As a political issue the question of the future of the road has made and unmade Mayors. Each succeeding incumbent has promised to do something about it, but none of them has done so. Fortunately, however, civil service has kept the railway out of the clutches of the patronage seeker.

The Seattle system has been operated at a loss each year it has been under municipal ownership. So acute did the situation become last spring that Councilman Erickson, veteran municipal ownership advocate, declared the railway to be hopelessly insolvent. He wanted to have the general fund contribute to the expenses of the railway, on the ground that it is an asset to the entire city. As matters stand now the system must be self-sustaining. Not only that but the purchase price must be amortized out of earnings. That is where the rub comes. Again Seattle is promised that something will be done about it. To that end both the present Mayor and the city superintendent of utilities would rehabilitate the system with the proceeds of a bond issue and reorganize and develop the property along modern rapid transit lines. An alternative suggestion is that the railways be leased to private operators with a franchise granted to them for long-term taxicab rights, the two services to be combined into one transportation system. As indicated elsewhere in this issue, it appears likely now that these rival programs will be submitted to a vote of the people next March. Such are the past political hazards, however, that there is no certainty that by the time March rolls around this program will then appear propitious.

This is not the first time that something needed to be done about the matter. But conditions would appear to have reached a crisis. The city's reputation has not only been hurt, but the Municipal Railway is now from $500,000 to $600,000 behind in its obligations without taking into consideration the inadequacy of the amounts that have been set aside annually for depreciation. Moreover, the city is losing approximately $525,000 a year that it would receive in the form of taxes upon its property and other payments if the lines were owned by a private company.

The full Seattle story is a long one of which this is merely a sketchy outline. There appears to be no adequate reason for this lack of achievement on the part of the city, for since 1923 the Municipal Railway has been on a rate of fare that provides for the payment of 10 cents in cash with an 8⅓-cent token fare. The record presented here and the accounts which have appeared in Electric Railway Journal from time to time substantiate the truth of the statement that municipal ownership of street railways in Seattle has proved a fiasco.

## Suggestions for Improving Convention Attendance

WHILE the American Electric Railway Association convention is a thing of the past, it has not passed so far into the background but that it offers suggestions for improvements next year, particularly in the matter of attendance at affiliated association meetings. It was noticeable in some of the meetings of the several affiliated associations, that the number of delegates who attended all of the sessions of their particular group was relatively small; and while the attendance at the opening sessions was fair, it was by no means what it should have been. But, at the final sessions of some of the affiliated associations, there was hardly more than a corporal's guard.

Many delegates were permitted by their managements to spend only two or three days at the convention. When it is considered that at least a part of the time available must be devoted to an inspection of the exhibits, it will be readily apparent that the time for attendance at meetings becomes very limited indeed. It seems quite obvious that full value from the investment made in sending men to the convention can be derived only by allowing these men sufficient time to attend all of the meetings of their respective associations.

There is, however, another side to this question. It was particularly noticeable at the last convention that a number of managements sent unusually large delegations, which in some instances included all of the men in responsible supervisory positions on their properties. Obviously, under these circumstances it became necessary to limit the time of attendance of each man, for it is an unusual property indeed which can permit all of its principal supervisory officials to be absent at one time. Faced with the alternative of limiting the number of departmental executives who go to the convention, or staggering the time of attendance so that all responsible officials are not away from a property simultaneously, there is much to be said for the latter policy.

There are, therefore, two considerations regarding convention attendance. It is highly desirable, in fact essential, that full attendance of important committee members and officers be assured at affiliated association meetings. It is likewise desirable to permit the maximum possible number of supervisory officials to derive the benefits of convention attendance. It is suggested, therefore, that in apportioning time among delegates preference be given to those men who are actively engaged in committee work or in directing the affairs of their respective associations as officers. Perhaps this would put committee activity at a premium. If so, it would be a healthy condition, for there are, unfortunately, too

many responsible departmental executives who give little attention to committee work which is the foundation of association activity and progress.

## An Exhibit That Stimulates Interest

LIVELY interest taken by both public and railway men in the exhibit staged by the Interborough Rapid Transit Company in New York during October suggests the desirability of such a temporary exhibit in other cities, when the occasion arises. The ordinary citizen knows very little about the nature of electric car equipment other than that electricity is the propelling force, and that it is taken from an overhead wire and is admitted to unseen motors by a controller on the front platform. The public cannot fail to be impressed by an exhibit which gives an opportunity to see the complicated nature and rugged appearance of the actual transportation equipment, as well as the ingenuity which has been exercised in devising the various parts.

For employees the benefit, of course, is even greater, because very few employees other than those whose work requires them to understand the equipment know much about its actual design. The railway accountant, for instance, should do better work if he has a knowledge of what railway apparatus looks like and does. Even trainmen can get clearer ideas of much of the apparatus under the car than they can from a school car only.

From every point of view the expense of an exhibit of this kind seems more than justified. The foundation of good public and employee relations is interest in the company's operations. There seems to be no better way of stimulating this interest in equipment and methods than that adopted by the I. R. T. in the exhibit which is described elsewhere in this issue.

## Canadian Railways Show Increased Earnings

STUDENTS of monthly traffic statistics of electric railways have been impressed for some time with the good record maintained by the Canadian properties. During 1927 the average increase in revenue passengers compared with the previous year of the Canadian companies reporting to the American Electric Railway Association was 3.48 per cent, and the monthly average increase of the same companies during the first ten months of 1928 was 4.63 per cent. The most striking feature of these figures is that during the same two periods, 1927 and the first ten months of 1928, every one of the six sections into which the United States is divided for the purpose of classifying traffic statistics, showed a decrease in the number of revenue passengers.

The American Association statistics are supplemented and confirmed by figures compiled by the Canadian Electric Railway Association. These data extend back to 1913 or earlier and show that while present electric railway traffic in Canada does not quite reach the total of 1920 (the record for all time in that country), there has been a constant gain during the past three years, and in 1927 the 1920 figure was nearly attained. This has been accomplished despite steady increases in automobile registrations in Canada. Even more satisfactory gains are shown in the figures for Canadian passenger revenue and net income. Finally, there has been very little change in the rate of growth of investment in Canadian electric railways for 27 years, except for a brief set back in 1920.

The reasons for this better showing of the Canadian properties compared with those on this side of the border are difficult to discover. It cannot be because of a more satisfactory fare situation, since there has been no material increase in city fares in Canada since 1922, yet the gain in both gross and net during the past three years has been continuous. The present Canadian city fare is now only 140 per cent of the pre-war level. There is probably less competition from private automobiles in Canada than in the United States, although the automobile registration in Canada now is about one to every ten inhabitants, approximately the same as our figures of six or seven years ago. Undoubtedly the longer winters in Canada have had something to do with the continuous patronage of the electric railways, but whatever the cause, the properties in our great neighbor to the north ought to be congratulated.

## Making a New Shop Pay for Itself in Three Years

ANTICIPATED economies amounting to $200,000 a year provide the principal motive that led the Philadelphia Rapid Transit Company to build its new $500,000 bus maintenance shop. With 570 gasoline-electric buses operating more than 20,000,000 miles a year, the company was in a position to realize the utmost in maintenance savings by having a central repair shop where all maintenance work can be co-ordinated. The centralized plan eliminates the need for more than 10 per cent spare vehicles, it reduces the amount of spare parts and maintenance stock that must be carried and it eliminates duplication of tools and shop forces that must result necessarily where the work is done at several points.

In the arrangement of the shop particular attention was given to routing the work and interlocking the various repair operations, so that a relatively small number of men employed steadily can make repairs. In deciding on the various departments the railway took a leaf from its book of experience gained in maintaining electric cars. Departments for electrical repairs, machine shop, sheet metal shop, wood-working mill, blacksmith shop, paint shop and tool room are all standard departments for electric car maintenance. Only by the addition of a department for overhauling bus engines has a new type of maintenance work been introduced that requires specialized methods.

Tools are located so as to prevent crowding and give plenty of room for orderly movement of material. Units are arranged so as to give workmen the advantage of good light. Overhead cranes and hoists provide for efficient handling. Lathes are arranged along the windows at one side of the shop and are staggered diagonally to facilitate the handling of bar stock and to prevent work on one machine interfering with that on another.

The fact that bus repair work often requires greater precision and closer fits than are used in electric car maintenance has been recognized by providing a complete assortment of precision instruments and special tools. Micrometers, gages, test blocks, and even a Brinell hardness tester and a scleroscope are included in the tool-room equipment.

More economical maintenance will result from having up-to-date tools for performing the various classes of work and from having experienced men skilled in the particular operations to carry it out. Convenient storage of material will reduce the time needed for repairs and the stock of spare parts can be kept low.

## More Evidence of Modern Transportation Merchandising

ADDITIONAL evidence of the disposition of those supplying public transportation to make their service more attractive is furnished by the announcement just made by the New York Central and the West Shore Railroads regarding changes in commuters' tickets and in the rates for excursion tickets. Thus, for use in the coming year, the New York Central and the West Shore Railroads have devised a new form of unlimited commutation ticket, resembling the old-fashioned pass card. It will require no punching, and can be bought for as many months ahead as the purchaser wishes, at the regular monthly rate. At the same time there will be offered a schedule of low-rate excursion tickets to the city and return, to be used at other than rush hours on the stamped date only. This, of course, places emphasis on the value to the companies of the off-peak riding, a type of patronage many electric railways have long since done their best to encourage.

It is true that the systems on which these "innovations" are to be introduced are steam lines, but the proposals now made embody principles which long since were accepted by the electric railways, particularly the principle of adopting changes that lighten the work of the conductor and make the service more attractive to the passenger. Apparently the roads have put aside entirely the idea that excessive use will be made of the cards. As the New York *World* sees it, "no holder is likely to put in time traveling back and forth merely for the fun of riding."

So concerned in the past have some transportation companies been with this possibility of abuse of modified fare plans, that they have permitted the likelihood of the abuse to obscure their view of the benefits of such plans. The announcement of the adoption of the new railroad commutation cards is particularly gratifying, since it carries additional evidence of the alertness of railway managements to the modern merchandising spirit of catering to the customer.

## Public Benefits From Crossing Protection

UNDER the terms of an executive ruling adopted by the Pennsylvania Public Service Commission last year, it has been made possible for the State Highway Department to share half of the expense of the installation of flashing light signals actuated by train movement for the protection of state highway crossings. As the result of this ruling, as pointed out in the report of the committee on safety of railroad operation of the National Association of Railroad and Utilities Commissioners recently presented at the annual meeting of that body in New Orleans, hundreds of applications have been made for protection of crossings under this ruling. In addition to the protection at the crossing itself, provision was also made for the installation of warning signs along the highway under the same conditions, i.e., that the railway company and the highway department jointly bear the expense.

Obviously, this general recognition of the public's part in creating the risk at highway crossings, and of the public benefits resulting from protection or grade separation, is a step forward in the protection of human safety and the conservation of life. The report goes a step further in pointing out that since the advent of the automobile in ever-increasing numbers, to the extent that this transportation agency has now become a serious competitor with rail carriers, the owner of the motor vehicle in all equity becomes a unit of assessment for his proportionate share of the cost of separating or eliminating or protecting grade crossings. The report proceeds to the ultimate conclusion that if the costs of separation, elimination and protection of crossings are to be assessed upon those benefited in proportion to the benefits conferred, that federal and state appropriations should be made therefor, so that the entire burden of cost may not rest upon the carriers and the local municipalities within whose limits the particular grade crossing to be protected may exist.

It may be a nice problem indeed to determine the fair allocation of benefits from a grade crossing project between a local community and the public at large. But there is no question but that the public does have a large share in the benefits of crossing protection or separation, and that the policy outlined in the report is constructive and forward looking.

## Saying It in 870,000 Words

IN DIRECTING that the Interborough case be reargued before it on Jan. 14, the Supreme Court said bluntly that the briefs "shall be compact, logically arranged with proper headings, concise and free from burdensome, irrelevant and immaterial matter." Washington observers regard this as one of the most severe rebukes that the court has ever administered to attorneys appearing before it. Counsel for the city should bear the brunt of this rebuke, it is felt, because they were the aggressors in the case. According to the order of the court, the decision was due to the voluminous manner with which the case was presented. It is believed, however, that confusion arising out of the injection of too much politics into the case is responsible also.

Those familiar with practice in the United States Supreme Court have stated that the reargument order in this case is the first of its kind in which it has been specified that the former briefs cannot be used. In the statement of the case to the court the city and the Transit Commission filed seven briefs with a total of 992 pages, and the transit companies filed nine briefs with a total of 810 pages. Because of the numerous briefs and appendices, much confusion resulted during the hearing of the former case before the court due to the inability of counsel to obtain prompt reference to statutes and other matter.

By this act, the court has focused attention on a matter that has long called for correction. Time and again, particularly in valuation cases, has it seemed that court and commission proceedings were drawn out beyond all need and the real issue obfuscated in a mass of words. In the New York case many important points are involved, but so far as the companies are concerned, the one central question involved, aside from the details and ramifications of the case, appears to be: Does the public service commission law of New York apply to the rapid transit railways and do the provisions of that law under the statutes of New York enter into and form a part of the fare stipulations in the contracts? If this correctly presents the issue, then the record, particularly that of the city, certainly appears to have been unduly burdensome. The desire of litigants is perfectly human not to want to overlook the presentation of any facts that may tend to strengthen their contentions, but a presentation that is estimated to contain 878,000 words can hardly escape the characterization of being verbose.

# Bay Ridge Electrification Completed

**Extension of single-phase system provides better freight connection between New Haven and Pennsylvania Railroads. Financial returns on electrical equipment of New York Connecting Railroad justify its cost**



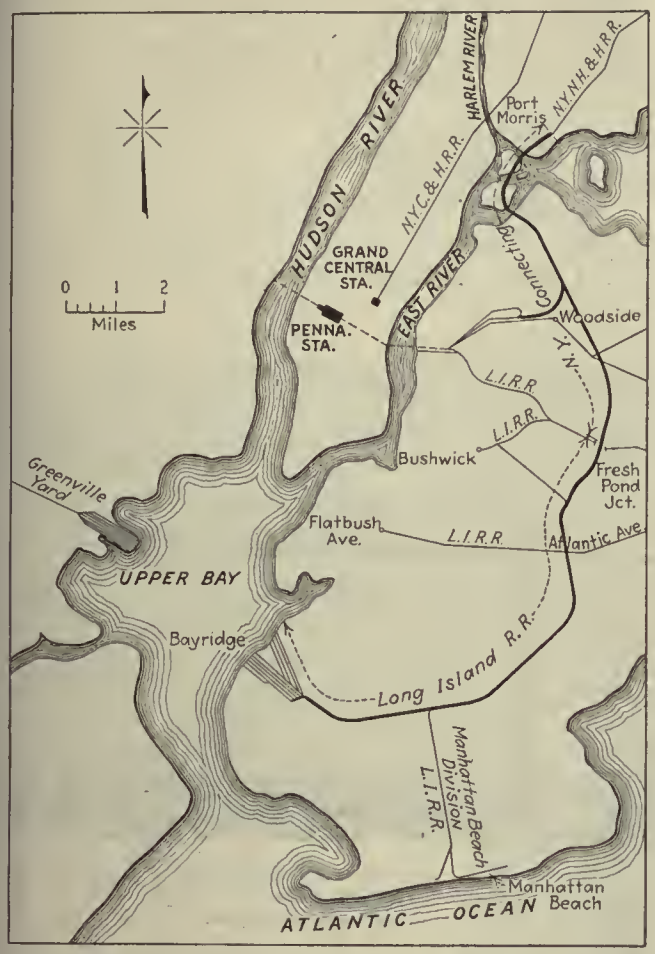
**Ladder track catenary and cross-span construction east of Third Avenue, Bay Ridge yard**

IN 1927, the freight line of the Long Island Railroad and New York Connecting Railroad from Port Morris to Bay Ridge was electrified, electric operation commencing in July of that year. This line carries two services. One is a through freight service operated by the New York, New Haven & Hartford Railroad, and the other a local freight and switching service operated by the Long Island Railroad.

The through service conducted on this railway is that between New Haven, Conn., and Bay Ridge Yard on New York Bay, where freight is handled by car floats across the bay, to and from Greenville, N. J. (the eastern freight terminal of the Pennsylvania Railroad). The Long Island company's service consists of local freight and switching service between Bay Ridge and Fresh Pond, and, at times, interchange of freight at Bay Ridge with its connections.

The so-called Kaufman act of the state of New York (later declared unconstitutional) prescribed the electrification of all railroads within the limits of the city of New York and adjacent counties. But, regardless of this, the returns, both direct and indirect, justified the cost, together with the advantages in eliminating smoke difficulties in the long tunnel under East New York.

A portion of this line had previously been electrified in connection with the inauguration in 1918 of through passenger service between Washington and points in New England, via the Pennsylvania and the New Haven lines over the Hell Gate Bridge. This portion included the New Haven's tracks at Port Morris, just east of the Hell Gate Bridge, and also two of the New York Connecting Railroad Company's tracks from Port Morris over the Hell Gate Bridge through Bowery Bay Junction (where the passenger line branches) to Sunnyside yard of the Pennsylvania Railroad, where connection is made to the tunnels under the East River into New York City. The accompanying map of the district shows that the New York Connecting Railroad section terminates at Fresh Pond Junction, the Long Island Railroad tracks commencing at this point and continuing south and westward through the borough of Brooklyn to Bay Ridge Yard. Adjoining the Bay Ridge Yard of the Long Island Railroad is the freight terminal of the U. S. Army Base, a portion of which was electrified at the same time.




**Track recently electrified as well as track between Port Morris and Sunnyside yards on which electric passenger service was begun some years ago**

The electric system adopted was the 11,000-volt overhead trolley, thus permitting through electric operation of freight trains from New Haven, Conn., to Bay Ridge, N. Y., a distance of some 86 miles.

The total track mileage electrified under this recent electrification is as follows:

| Road | Route Miles | Track-Miles |
|---|---|---|
| New York Connecting Railroad | 8.14 | 14.00 |
| Long Island Railroad | 11.56 | 80.80 |
| U. S. Army Base | ..... | 2.50 |
| Total | 19.70 | 97.30 |

Between Fresh Pond and Manhattan Beach Junction there are four tracks for a distance of 7 miles. The balance of the line is two track. Forty-eight industrial sidings were also electrified at the same time.

The general alignment is a fairly simple one, the average curvature being on the order of 1 deg. with a maximum of 4 deg. 24 min. Grades are fairly heavy, the maximum being 1.2 per cent at the eastern approach to the Hell Gate Bridge.

The road traverses a thickly settled portion of the boroughs of Brooklyn and Queens, and is crossed by 50 highway bridges. There are also two tunnels, one 3,500 ft. long and the other 500 ft. long. In and under many of these the overhead clearance was very limited.

For some ten years freight service has been operated between New Haven and Bay Ridge over the Hell Gate Bridge, but not as a through run on the section from Bay Ridge to Oak Point yards, where steam locomotives were used. The trains were limited to only 2,150 tons, due to limited capacity of the steam locomotives. At Oak Point yard they were filled out to 3,800 tons for handling to New Haven, Conn., by double-headed electric locomotives. Under electric operation 1,600-ton trains (32 cars) for single locomotive and 3,200-ton trains (64 cars) for double locomotive are being operated, east-bound, direct from Bay Ridge to Cedar Hill yard (New Haven), thus eliminating the stopping and filling out at Oak Point.

The total number of through trains east-bound, used as a basis of estimate, was 600 cars, consisting of:

Seven 3,800 ton trains per 24 hours (double-headed).
One 1,750 ton train per 24 hours (double-headed).
Eight trains total per 24 hours.

The movement west-bound from Oak Point to Bay Ridge was also taken as 600 cars handled in eight trains of 75 cars each.

The characteristics of two New Haven 076-0111 type electric freight locomotives compared with the heaviest (J-2) steam locomotives are as follows:

COMPARATIVE TRACTIVE POWER OF STEAM AND ELECTRIC LOCOMOTIVES

| | Steam | Two Electrics | Ratio |
|---|---|---|---|
| Weight on drivers, lb | 240,000 | 357,600 | 1.37 |
| Tractive effort, starting, lb | 58,000 | 100,000 | 1.71 |
| Tractive effort, continuous rating, lb | ..... | 34,200 | .... |
| Tractive effort, one-hour rating, lb | ..... | 49,600 | .... |
| Tonnage rating from Oak Point to Cedar Hill, tons | ..... | 3,800 | .... |
| Tonnage rating from Bay Ridge to Oak Point, tons, east | 2,150 | 3,200 | 1.43 |
| west | ..... | 2,000 | 0.99 |





**At left, cross-beam bridge construction on curve. At right, cross-span construction with H columns on four-track tangent**



There are many highway bridges on the new line. This view shows the method of supporting the feeders under these bridges



Through operation of the New York, New Haven & Hartford Railroad's a.c. freight locomotives was a prerequisite. These locomotives are not equipped with a.c.-d.c. control, as are the company's passenger locomotives, which have to operate on the New York Central's third rail into Grand Central Station. This, together with its general suitability for this class of service, led to the adoption of the a.c. single-phase trolley system, this also being the standard of the Pennsylvania Railroad which controls the Long Island Railroad. The earlier Long Island electric operation, largely multiple-unit passenger service, is by the d.c. third-rail system.

Power is obtained from the New York, New Haven & Hartford Railroad's power system, which consists of a generating station at Cos Cob, supplemented by purchased power delivered at West Farms in the borough of Bronx, New York City, and Devon and New Haven in Connecticut. This power supply is further supplemented by an emergency supply from a frequency changer station at East New York, capable of delivering 5,000 kw. to or from the Long Island Railroad's power system. This frequency changer set is also operated as a synchronous condenser during heavy load periods to improve the power factor and trolley voltage.

The 22,000-volt power is delivered to six outdoor transformer stations along the right-of-way, as follows:

| Location | Kva. |
|---|---|
| Bungay Street (Bronx) | 3,000 |
| Bowery Bay (Queens) | 3,000 |
| Fresh Pond (Queens) | 3,000 |
| New Lots (Brooklyn) | 3,000 |
| Manhattan Beach Junction (Brooklyn) | 3,000 |
| Bay. Ridge (Brooklyn) | 3,000 |

The transformers are auto type, outdoor and self-cooling.



At left, sectionalizing switching structure and cross-span details. At right, anchor bridge on four-track tangent

The electrical apparatus was supplied by the Westinghouse Electric & Manufacturing Company, the Pittsburgh Transformer Company, the Electric Power Equipment Corporation and many others.

### Distribution

The distribution system is the same as that of the New Haven, which is a 22,000-volt, three-wire system, the trolleys being 11,000 volts, the feeders 11,000 volts of the opposite polarity and the track return the neutral point.

Four No. 0000 copper conductors are carried as feeders on pin insulators on the catenary poles in the open construction. As has already been noted, there are numerous highway bridges of very limited clearance over the tracks, requiring that the feeders be carried on tall poles so as to span over the highways.

On main tracks both rails have joints bonded. The gas flame welded bond is used throughout, welded to the head of the rail.

### Catenary Construction

Rolled steel H columns are used for poles throughout the electrification. Two types of foundations are used for these poles, the predominating one being that used for poles not subjected to curve pull from the wires, and also for poles subjected to curve pull but which could be guyed. For this foundation a cylindrical hole was dug in the ground about 3 ft. in diameter and from 6 ft. to 10 ft. deep. The hole was then lined with a length of corrugated steel culvert pipe. A shallow layer of dry concrete mix was then laid at the bottom of the hole,

and on top of this was placed a loose steel plate to act as a base for the pole. These plates were all set carefully to correct elevation from the top of the rail and bore guiding angles for placing the pole at correct distance from track. This method permitted the opening up of a quantity of holes prior to the setting of the poles without danger of cave-ins. At a convenient later time the poles were delivered and erected by work train and derrick, then wedged in place in the culvert pipes. A second work train followed, equipped with water tanks and concrete mixer, and the hole was filled with concrete.

| | One Motive Power Unit |
|---|---|
| Wheel arrangement | 0–6–0 |
| Rigid wheelbase, ft., in. | 12–8 |
| Diameter of drivers, in. | 62 |
| Length over coupler faces, ft., in. | 63–0½ |
| Total weight, and weight on drivers, lb. | 158,000 |
| Maximum tractive effort, lb. | 50,000 |
| Motors, three | 190 hp., 235 volts, a.c. series-connected type |

Self-supporting poles on curves have the usual square concrete foundations with forms built in place. The signal bridge foundations are of the same type.

Cross catenary is used generally for the support of the messenger and trolley wires. On curves, poles are guyed where possible, a precast reinforced concrete anchor being used with guys of extra high strength steel strand. Where it is impossible to use guys, the beam type of bridge is used, consisting of H column poles, already mentioned, with cross beam of H section with sag braces of angles.

The longitudinal catenary system consists of a phono-electric bronze strand messenger, from which are suspended phono-electric round rod hangers. These hangers support a No. 0000 copper auxiliary messenger to which the No. 0000 bronze contact trolley is fastened by bronze clips and bolts. The cross catenary is also bronze strand with bronze hangers. The entire catenary system, therefore, is of non-corrodible materials.

### Character of Construction

Despite the shortness of the route (20 miles), it will be noticed that the track mileage is more than 97 miles. Included in the mileage are 4 interlockings, 48 industrial sidings and 11 yards of from 5 to 30 tracks. It will, therefore, be seen that the amount of special work was very high, making the construction work considerably more difficult than a mere tally of the track mileage would indicate. Construction work started April 1, 1926, and partial electric operation commenced between New Lots and Fresh Pond in April, 1927. Through service between Port Morris and Bay Ridge commenced June 29, 1927.

### Switching Locomotives

As before stated, the through freight service of the New York, New Haven & Hartford Railroad is handled by the company's standard electric locomotives, the characteristics of which have already been given.

The Long Island Railroad's switching and transfer service is handled by fourteen motive power units designed to be used either singly or coupled together and operated as one locomotive. These locomotives were designed by the motive power department of the Pennsylvania Railroad, and the mechanical parts were built at that company's shops in Altoona, Pa. The electrical apparatus was supplied by the Westinghouse Electric & Manufacturing Company.

The main characteristics of these locomotives are as given in the table in the preceding column.

### Design and Construction

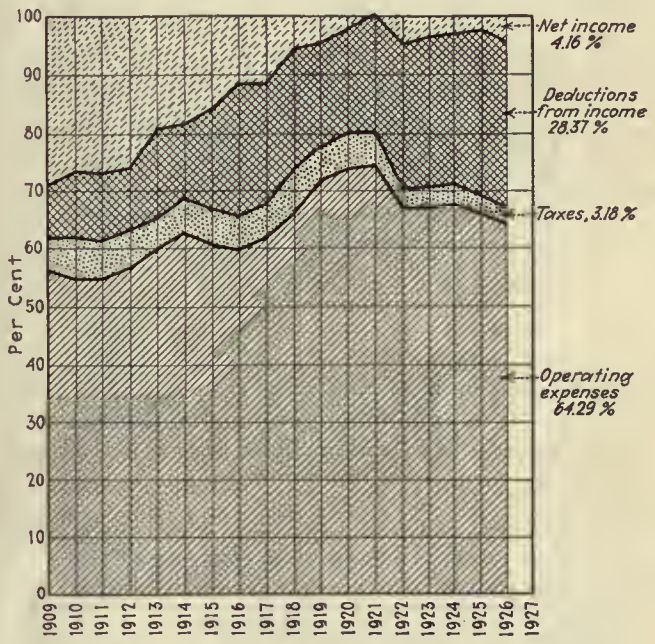
The design and installation of the complete system was done by Gibbs & Hill, Inc., consulting engineers for the railroad, in collaboration with the railroad's operating officials and engineers.

# Progress Indicated from Canadian Statistics

**Electric railway revenues have shown continuous increase from 1900 to 1927. Capital investment also increases**

LAST year the Canadian Electric Railway Association compiled and published some interesting statistics on electric railways in Canada. This year the figures and charts have been brought up to date and new ones added.

The table below shows passenger revenue in 1926 was nearly nine times that in 1900, and that the revenue per




**Distribution of total revenue of Canadian electric railways, 1909 to 1926**

mile of single track was 2.26 times as great as in 1900. The increase in operating expenses per mile of single track was even greater than the increase in revenue, being

TABLE SHOWING PASSENGER REVENUE AND TOTAL OPERATING EXPENSES. CANADIAN ELECTRIC RAILWAYS

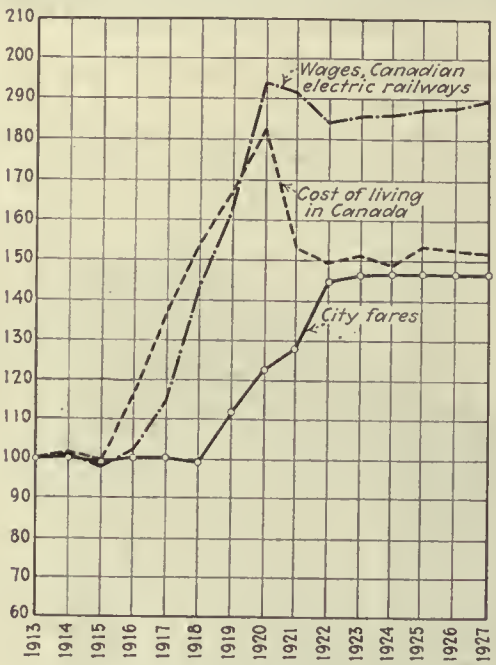
| | Total Passenger Revenue | Pass. Rev. per Mile of Single Track | Oper. Exp. per Mile of Single Track |
|---|---|---|---|
| 1900 | $5,529,687 | $8,192 | $5,237 |
| 1905 | 8,932,914 | 11,265 | 7,463 |
| 1910 | 16,125,994 | 11,660 | 7,319 |
| 1915 | 25,579,689 | 12,211 | 8,622 |
| 1920 | 43,279,009 | 17,832 | 15,757 |
| 1925 | 45,185,402 | 17,616 | 13,811 |
| 1926 | 46,810,403 | 18,509 | 14,414 |

2.75 times as great as its 1900 level. A reduction in operating expenses per mile of track between 1920 and 1925 can be attributed largely to the introduction of one-man cars. The total passenger revenue of the Canadian

electric railways in 1927 was $48,289,774, and they had in operation 2,507 miles of single track.

The first chart shows the percentage distribution of total revenue by years from 1909 to 1926. The increase in operating expenses and in deductions from income are notable. The latter increase is due to the large amount of financing which has been done by the issue of bonds, particularly where electric railways have been municipally owned. In such cases, if privately owned, stock would have been issued. The reasons for the reduction in percentage in operating expenses since 1921 have already been outlined.

The second chart gives comparison of fares, electric railway wages and the cost of living in Canada, the curves being charted by index numbers, with 1913 repre-



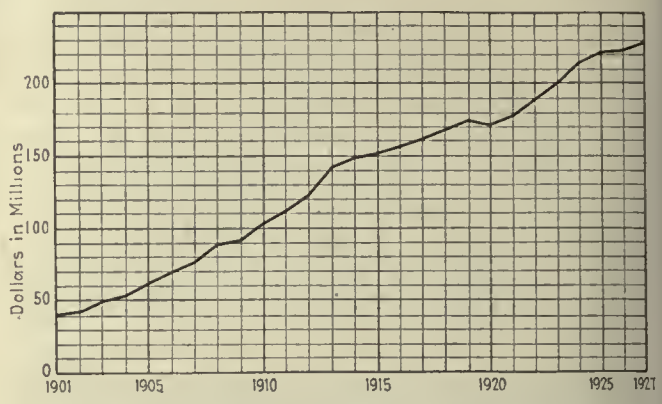

**Fares and wages on Canadian electric railways; also the cost of living in Canada**

senting 100. The cost of living, which rose rapidly from 1916 to 1920, dropped just about as sharply in the latter year but not so far. Since 1921 it has remained at about 150 per cent of the 1913 figure. Wages have also dropped considerably since 1920, but not in the same proportion as the cost of living, and there has been a slow increase in wages since the low point in 1922. Wages are now 90 per cent higher than in 1913, having had an increase almost twice as great as the cost of living and just about twice that of fares. The figures on wages have been obtained from the Dominion Labor Department and on the cost of living from the *Labor Gazette*.

The third chart gives the capital investment in Canadian electric railways from 1901 to 1927. Continued increase in that investment indicates belief, in the opinion of investors, of the stability of the electric railway industry of Canada. In 1927 the electric railways in Canada operated 4,397 electric cars and 212 buses.

Automobile registrations in Canada have increased from 50,000 in 1913 to 939,000 in 1927. From 1913 to 1916 the annual increase was on an average of 24,000. From 1916 to 1927 the annual increase has been greater, with an average of 74,000. The population of Canada in 1921 was 8,788,483 and in 1927 about 9,500,000.

The number of revenue passengers continued approximately the same, averaging 595,000,000, from 1913 to




**Capital investment in Canadian electric railways**

1918. From that date the number increased until the peak was reached in 1920, when 804,711,333 passengers were carried, being an increase of 35.2 per cent over 1918. In 1921 there was a decrease of 85,405,892 from 1920, or 10.6 per cent. From 1921 to 1925 the number of revenue passengers carried showed little if any change. In 1926 an improvement was shown with 748,710,836 against 725,491,101 in 1925, or an increase of 3.20 per cent. In 1927, however, a still greater improvement was shown, 776,615,193 revenue passengers being carried as against 748,710,836 in 1926, or an increase of 3.75 per cent; this in face of the large increase in automobile registrations in the past two years. In 1927 automobile registrations increased 13.3 per cent over 1926.

The 1928 returns during the early months of 1928 register an average gain of 5 per cent over 1927 in the number of revenue passengers carried. These gains appear to be steadily increasing.

## Shield Confers Style



**These distinctive signs of the Market Street Railway help to identify construction tool boxes and other equipment in San Francisco**

CONSTRUCTION tools and other street equipment of the Market Street Railway, San Francisco, Cal., are marked by a large shield, adopted by the company as a standard emblem. The emblem not only identifies the owner of the equipment but is proof to observers of the extended nature of the company's business.

The shield is of baked enamel with a green border and an inside red panel with white lettering. Illustrations show it on a construction truck and a tool box. It is also used on barrier signs, welding equipment, etc.




Looking down the overhaul lines in the new P.R.T. bus shop

# New P.R.T. Bus Shop

## Puts Maintenance on Production Basis

**Expected saving of 1 cent per bus-mile will pay cost of entire plant in three years. Specialized shop departments occupy one side of building while vehicles being overhauled move in four lines along opposite side. Training of workmen an important feature of shop operation**

RAPID growth of bus operation in Philadelphia is reflected in the completion recently of a half-million-dollar plant wherein will be conducted all major maintenance operations for the entire bus fleet of the Philadelphia Rapid Transit Company. The new structure, which is situated at Third Street and Hunting Park Avenue, is the largest bus repair shop in America and probably the largest shop in the world devoted exclusively to automotive repairs.

Bus service was inaugurated by the P.R.T. in September, 1923. At that time the fleet consisted of fourteen vehicles. This modest forerunner of the present-day fleet was housed in a corner of the 24th Street and Fairmount Avenue carhouse. Subsequent growth has been rapid and today the company has 570 gasoline-electric vehicles. These are housed in eight operating garages variously located in Philadelphia and Camden, N. J.

The new plant has a ground area of 10 acres. The building is a one-story structure, with a floor area of 110,000 sq.ft. It represents an investment of $500,000, of which more than $100,000 was expended for maintenance facilities and shop equipment. Before attempting to lay out this project H. B. Hewitt, general superintendent of the company, and his associates personally visited and studied many of the important bus operations in this country and Europe in order that no detail in the way of improved methods might be overlooked. The result is a bus shop that embodies the most modern ideas.

Among the more important items that can be included in the yearly potential production capacity of this plant are: 600 completely overhauled buses; 500 complete paint jobs; 600 rebuilt engines; 3,200 sets of relined brakes; 2,000 power motors overhauled; 1,000 power generators overhauled; 500 distributors and coils rebuilt; 500 batteries partially and completely rebuilt; 2,000 universal joints rebuilt; 600 steering gears overhauled; 650 sets of bus seats reupholstered; 650 sets of window sash rebuilt; 600 front axles rebuilt; 600 rear axles overhauled.

Three important advantages are gained by grouping all facilities under one roof. First, it eliminates the need for more than 10 per cent of spare vehicles. Second, it reduces the size of stock inventories. Third, it is possible to have all major repairs and overhaul work done by a relatively small number of men.

### Will Pay for Itself in Three Years

One of the most important factors that influenced the P.R.T. in this undertaking is an anticipated saving of 1 cent per bus-mile. With a yearly operation in excess of 20,000,000 miles, the new shop will pay for itself through these savings in less than three years.









The arrangements of the plant and the routing of the work are important factors in the successful operation of this shop. Buses scheduled for repairs are first given a thorough cleaning on the wash rack, to remove grime and dirt that otherwise would be carried into the building.

The bus is then driven over the service pits. Extending over the four lines at this point is an overhead crane for lifting and removing the various chassis units. In the pits are jacks for handling the motors and generators, as well as other under-chassis parts. Here the engine and motive power units are removed and distributed to the respective repair departments. If for any reason the body must be removed the job is done at this time and the unit sent to the body shop on a dolly truck.

As the chassis moves forward on the line, the radiator, steering gear, battery and axles are removed in turn and reconditioned units installed. There is no attempt to make running repairs on these parts except in one high-speed line provided for emergency work.

Units are removed—and replaced—at the point along the line which is most convenient to the respective repair departments. For example, the axles are replaced at a point adjoining the axle overhaul department, the engine installed when the bus is nearest the engine department, and the body repaired when the vehicle is convenient to the sheet metal, the wood-working and the upholstery shops.

At the pits midway along the lines the frames are thoroughly gone over and all loose rivets replaced. The vehicle then moves forward to the body section, where damaged panels are repaired, broken windows and sashes replaced and seats and interior linings carefully gone over. Fenders, when not too badly damaged, are straightened or welded without removing them.

All repairs having been completed on both chassis and body, the vehicle is moved onto the forward pits. Here it is thoroughly inspected—but only for possible imperfections in assembling. The checking of the various units for defects in material, faulty operation or workmanship, is the duty of the inspectors in the various shop departments. Finally, the bus is run onto the brake-testing machine and, if found in good order, is sent to the paint shop, after which it is ready to take its place again in daily operation.

The specialized shop departments are situated, for the most part, along the west wall of the building.

On entering the wood-working shop, which is situated immediately back of the offices, there is an impression of clean, wholesome working conditions which prevails throughout the entire shop—not even excepting the pits and cleaning racks. Although there are some ten mortisers, jointers, planers and other wood-working machines in this area, all busily engaged in work that produces large quantities of wood dust, shavings and chips, the air is singularly clean because all refuse is drawn away from the machines as fast as produced and piped through an overhead exhaust system to a large metal container outside the building. Accumulations are carted away to be burned under heating boilers. This shop furnishes all body frame members, flooring, special seats, doors, window frames and other replacement parts that are

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No. 1—The stockroom houses materials worth $150,000. Metal shelves and bins make for economic use of storage space.

No. 2—A corner of the salvaged materials stockroom. Orderly arrangement here means greater speed in filling requisitions.

No. 3—The wood-working shop presents a neat appearance. Sawdust and chips are taken away by overhead exhaust system.

No. 4—Cradle top lifting devices in the repair pits make removal or installation of heavy parts a simple matter.

needed to keep P.R.T. buses in good order. It also supplies a large variety of general millwork that is continually needed by an organization of this size.

The machine shop adjoins the wood-working mill. Here are production tools of the type rarely found outside of manufacturing plants. There is no crowding of machinery in this shop. Each unit is placed so as to give the machinist plenty of light and operating convenience. All machines are served by an overhead monorail crane. The lathes, numbering five in all, are ranged along the windows in the west wall and are staggered diagonally to facilitate the handling of bar stock and at the same time to prevent workmen at one machine from being injured by flying chips from another.

The tool room, which is a part of the machine shop, contains a large variety of precision instruments and special tools. Micrometers, gages, test blocks, every conceivable size of tap and die, and even a Brinell hardness tester and a scleroscope are found here. In addition there is a tool-room lathe, a sensitive drilling machine and a drill point grinder.

This department designs all of the tools used in the machine shop as well as jigs, fixtures and special appliances required by the other departments. Tools are issued on written order only. The mechanic signs a card check which is held by the tool-room clerk until the borrowed item is returned. Ordinary hand tools are furnished by the mechanics themselves. An agreement with a local dealer enables the men to purchase tools at the same discount allowed the P.R.T.

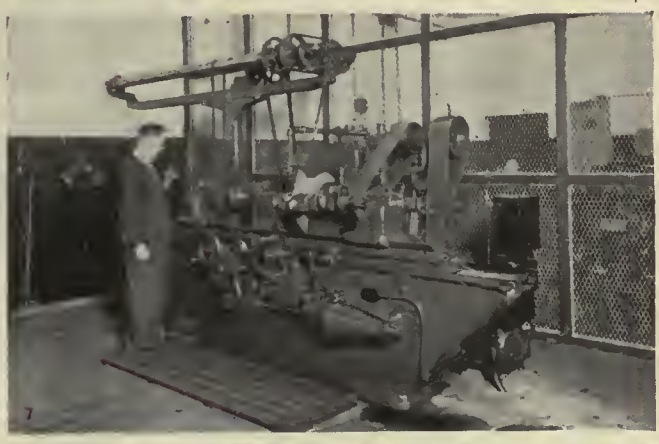
The engine overhaul department can turn out fourteen completely rebuilt engines a week with a force of fourteen men. No repairs of any description are handled in this shop. Its functions are limited to dismantling and reassembling—its job, to guarantee 105,000 kw.-hr. (approximately 90,000 miles) of unimpaired engine operation. Here the units are dismantled and the carbureter, generator, starting motor and other accessories removed and sent to their respective overhaul departments for inspection, adjustment and repairs.

The electrical shop has two subdivisions: one is devoted solely to the maintenance and repair of starting, lighting and ignition units; the other handles nothing but power-electric motor and generator units. The former is well equipped with instruments that simplify the job of the electrical technician and save time for the trouble shooter. All tools and testing equipment are arranged with special regard to the convenience of the workmen. An overhead monorail crane ranges the entire shop and is supplemented at key points by swing arm cranes and portable platform type lift trucks. Thus the need for manual lifting is reduced to a negligible factor.

The motive power shop, differing from practice followed in the engine department, is entirely self-contained and handles every operation from the time the defective motor or generator unit is removed from the chassis until it is finally rebuilt and again ready to be reinstalled. Lathes have been installed for renewing the working surfaces of the commutator, machines for rewinding the armature coils and innumerable other tools for the manifold operations incident to the daily work of this depart-









No. 5—Dismantled parts are cleaned in a steam washing tank to determine if they are worth salvaging.

No. 6—A corner of the tool room where various jigs, fixtures and machine shop tools are made.

No. 7—Crankshafts are reground on this machine while the engine is in process of overhaul.

No. 8—Installation of dipping pots and a baking oven enables P.R.T. to impregnate and bake all armatures and field coils.

ment. Recent installation of an electric oven now enables the P.R.T. to impregnate and bake armature and field coils, a class of work that was formerly handled by the manufacturer.

Adjacent to the motive power shop are the combined radiator and gasoline tank departments and, in a fireproof-partitioned room, the blacksmith shop. The hammer of Vulcan is driven by an electric motor while the flaming forges are fanned by air turbines. Both electric and acetylene welding are needed to carry on the intensive production schedules of this department. Its tasks include not only the repairing of chassis and body parts but also the fabrication of steel framework, the manufacture of "bus stop" sign standards, pipe bending, also spring repairing and testing. For the latter purpose a laboratory testing machine has been installed and in the future springs will be tested for loss of resiliency or other defect each time a vehicle is brought to the plant for scheduled overhaul.









**Exacting Tests Insure Proper Operation**

No. 1—A machine that accurately determines spring condition.

No. 2—An instrument for determining hardness of metals is an important item of tool room equipment.

No. 3—Testing brakes. The last step on the overhaul line prior to painting.

No. 4—Frequent carburetor tests are essential to economic fuel consumption.



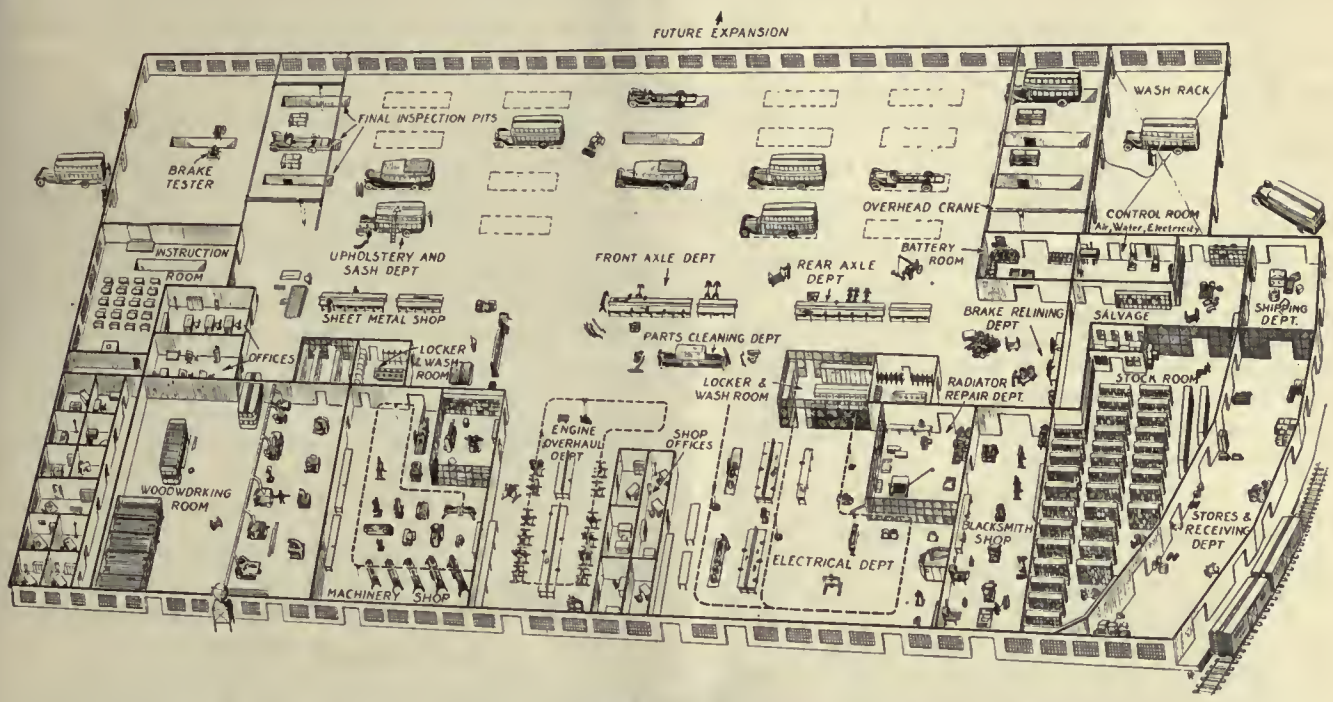
**Brake relining keeps a crew of four busy all day long**



**The mechanical sledge makes blacksmithing a one-man job**

In the brake relining department four men are kept busy all day long, each with his own particular task. For example, one man does nothing but strip off worn lining, another drills the new materials, a third countersinks and inserts rivets while a fourth operates the pneumatic riveter. Linings are purchased directly from the manufacturers cut to proper size with edges chamfered and ready to apply. To simplify installation each piece is run through rollers which bend it to conform with the face of the brakeshoe.

The battery room is situated at the rear of the plant adjacent to the four vehicular entrance doors, and where buses destined for the overhaul lines can be served with utmost convenience. Inconspicuous with regard to location, the battery shop, nevertheless, is in the front ranks so far as importance is concerned. Each year more than 500 disabled batteries pass through this shop and




**The plant is laid out to secure maximum efficiency and minimum lost motion. The result—lowered unit production costs and increased output from the assembly lines**

emerge completely rejuvenated, serviceable units. Some of them need complete rebuilding, others need a new cell group or a new case or perhaps only a change of electrolyte. No job is too large or too small for this department. As units are removed from the buses they are placed on grocer-type trucks for delivery to the battery room. Each truck has a normal capacity of five batteries in single tier but will handle ten units in a double tier. In so far as possible, the batteries are serviced and charged without removing them from the trucks, thus doing away with benches and the need for any great amount of manual lifting.

Both the front and rear axle departments, as well as the parts cleaning tank, are placed in the center of the plant midway between the shops and overhaul lines and therefore convenient to both. Axle assemblies as received from the overhaul line are dismantled and parts sent to the steam cleaning tank where dirt, grease and other foreign matters that might prevent careful inspection or accurate measurements are removed. Salvageable parts are sorted out for subsequent reconditioning either by machining or building up process, while those that are too far gone to permit reclamation at reasonable cost are consigned to the junk pile.

On rear axles, the worm carriers are removed and completely gone over and new or rebuilt parts substituted for worn ones. Axle shafts and bearings are replaced, if worn, and the housing thoroughly inspected for cracks



**A corner of the machine shop, with plenty of light and working room in evidence**



**For bus maintenance only—new P. R. T. plant at Third Street and Hunting Park Avenue, Philadelphia**

or distortion. Front axles are checked for misalignment and new bushings and king pins fitted. Worn spindles and bearings are replaced. Production of front axles totals twelve a week with a similar number of complete rear axles and worn carrier assemblies.

The sheet metal department is equipped with shearing machines as well as tools and devices for bending, rolling, forming and crimping sheet steel and aluminum. Its duties include the cutting and shaping of hoods and body panels, also the manufacture of metal trays and countless other things used about the garage. In addition to taking care of all repairs, the upholstery shop turns out tpproximately five sets of seats per week. The sash department not only reglazes windshields, doors and windows but also manufactures for replacement five complete sets of sash weekly.

### Stock Inventory $150,000

Material worth approximately $150,000 is carried in the main stock room, which also supplies materials for the subsidiary stock rooms located at various operating garages. A system of card tags showing unit inventory costs has been worked out, one of these cards being attached to each storage bin or compartment. In this way it is possible for the stockkeeper and foremen issuing an article to know the actual cost of that particular item, simply by referring to the card on the bin. The psychology of this practice is to give individual employees a better understanding of the dollars and cents value of the repair and replacement parts used.

Adjoining the stock room in the extreme rear of the building is the salvage and reclamation department, where units sent in from the various operating locations are examined, tagged for repairs or stored for salvage purposes. Both this department and the stock room face on a broad concrete loading platform which is served by a railroad spur track and is also available for truck loading. An inclined concrete ramp from the lower ground level gives access to the building.

To the west of the shop but in a different building is the experimental laboratory where standard practices for the machine shops and garages are set up and new maintenance and operating developments worked out. It will accommodate one double-deck bus, two single-deck buses or four taxicabs. It possesses every facility for the widely varied range of work contemplated by company engineers. An example of the results which have been obtained from this work in the experimental laboratory is the increase by 33⅓ per cent in horsepower output of bus engines used on P.R.T. vehicles.

An experimental paint shop also has been set up adjoining the bus shop, and exhaustive research in the problem of spray painting is to be carried on at this point, while construction work on the main paint shop is under way. The methods which will be followed as standard practice in the new paint shop will depend largely on the outcome of research work to be done in the interim.

### Personnel Training Proves Valuable

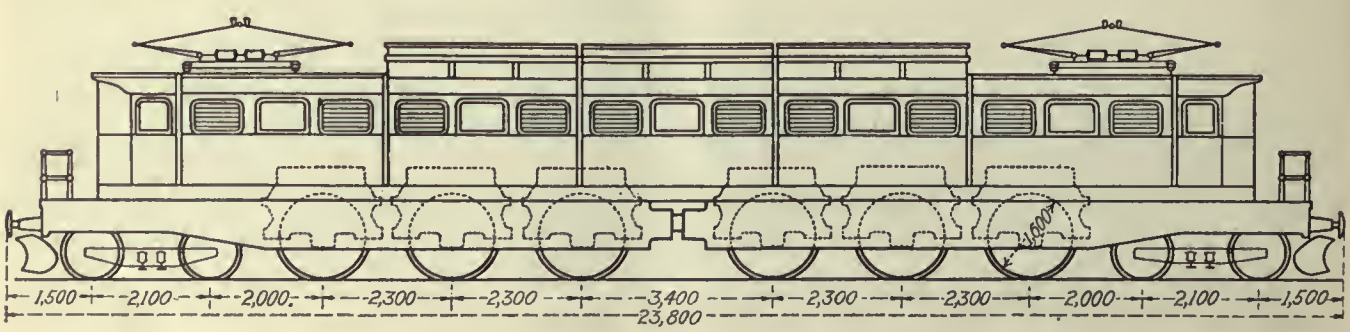
The instruction room ranks among the most important departments in the plant. Here, by means of moving pictures, illustrated lectures and practical working demonstrations, the company expounds its theory that there is all the difference in the world between telling a man to do a job and explaining the reasons why. Training classes are carried on in the evening and all employees are given an opportunity to attend. During these classes many problems of the day are brought up and ensuing discussions very often result in suggestions that are valuable to both company and employees. As a result of constructive suggestion, the men are ever on the alert for new ideas and better ways of doing their job.

## 5,400-HP. Electric Locomotives for French Railroad

FOUR d.c. electric locomotives recently ordered by the Paris, Lyons & Mediterranean Railway, France, will, it is claimed, rank as the most powerful single locomotives so far built. The contract for the electrical equipment of the engines, which are to have a one-hour rating of 5,400 hp., has been placed with the Société Oerlikon, Paris, while the mechanical part is being constructed by the Société de Construction des Batignolles in Paris.

Four years ago the P.L.M. Railway started a trial service on a section of the Mont Cenis tunnel line, with a view to collecting data regarding the most suitable type of express locomotive. Four different trial locomotives were ordered. The results obtained in these tests with an Oerlikon individual-drive engine proved most satisfactory. Investigation showed, however, that it was advisable to have a considerably higher output than that of the trial locomotive; in view of which the number and output of the driving axles had to be increased.

The locomotives now in course of construction are of the 2CoCo2 type with close-coupled trucks and an overall length of body of 78 ft. They have the Oerlikon individual drive, each of the six driving axles being driven by a twin motor. With a pressure of 1,350 volts at the contact line, these motors each develop 800 hp. at 45 m.p.h., while with the full pressure of 1,500 volts the one-hour rating is 900 hp. per motor or 5,400 hp. for the locomotive, outputs being measured at the wheel treads. The permissible axle load is 18 tons and the maximum speed 80 m.p.h. The locomotive weighs 153 tons, so that the weight per horsepower at the one-hour rating is 63.5 lb.




Side elevation of 5,400-hp. locomotives recently ordered by P.L.M. Railway

# Glasgow Modernizing
## Gets Fine Start

**Concentration of rehabilitated and modernized cars on Uddingston route increases earnings 1.6 cents per mile within the first four weeks. The Tramways schedule speed was increased to 10 m.p.h.**

*By Walter Jackson*
**Fare and Motor Bus Consultant**

FOR many years the Glasgow Corporation Tramways has stood out as a conspicuously successful example of street railway operation. The fares were the lowest in Great Britain and headways were so short that walking was an almost unknown form of outdoor sport.

This undertaking was one of the last to succumb to the need for a higher scale of fares, due partly to the heavy traffic and partly because the greater part of the investment had been paid off, in addition to setting aside funds for depreciation and renewals. At the present time, in fact, only 44 per cent of the investment remains outstanding on the books.

During 1925, or about the time a healthy financial condition had been restored, the motor bus made its appearance as a competitor. These buses could be regulated only with the greatest difficulty because their ostensible purpose was to pick up passengers outside the Glasgow area and deposit them within Glasgow. Actually, many of them did pick up city riders at considerable loss to the Tramways.




**Glasgow cars are being reconditioned both for better technical performance and greater passenger comfort**

Since the Parliamentary regulation of services of this kind is still in a nebulous state, the Glasgow management had to find some quick means of helping itself out of this situation. At that time the scale of fares ranged from 1d. to 10d. Most of the bus pick-ups were longer-ride passengers. Upon recommendation of the general manager, on July 1, 1926, the maximum fare was reduced to 2d. (4 cents).

This had the immediate effect of bringing back much of the lost business and creating some new traffic in addition. However, at no time did Lachlan Mackinnon, general manager, believe that so low a fare as 2d. should remain permanently.

The 2d. all-the-way rate was simply a dramatic way of letting the unregulated competitor know that he would have a fight on his hands and was a "hands-off" warning to possible newcomers. Meanwhile, the management was making plans along two lines that would maintain the priority of the Glasgow Corporation Tramways. The first of these lines was the inauguration of motor-bus services. The second was the replacement of the oldest cars and the modernization of the remainder.

The 2d. all-the-way fare having achieved its purpose, the management suggested July 10, 1928, an increase to 3d., which would still be 7d. under the old maximum fare. At the same time Mr. Mackinnon suggested the abolition of the minimum fare of ½d. which was reinstituted July 1, 1927, following its first abolition on June 1, 1920. The new scale as recommended to the corporation is as follows:

NEW SCALE OF FARES IN GLASGOW

| | Stages | Average Distance (Miles) |
|---|---|---|
| 1d. | 2 | 1.14 |
| 1½d. | 4 | 2.28 |
| 2d. | 8 | 4.64 |
| 2½d. | 12 | 6.96 |
| 3d. | Over 12 | .... |

With the foregoing scale in vogue, the management believes that it will earn revenues sufficient to carry out an extensive modernization program. It is already operating 45 motor buses and has 100 more on order. Of the buses, fifteen are double-deckers seating 51.

### Fifty New Cars Ordered—150 Cars Modernized

As can be said of many American street cars, Glasgow's tramcars have been built and maintained altogether too well. If it hurts to scrap a car in America, what shall be said about doing the same thing in Scotland? However, like causes bring like results. So long as the Glasgow public knew only the hard-seat tramcar, it was content to glory in the cheapness of the ride; but when personal cars were reinforced by a flood of soft-seated motor buses, the "good old trolley" looked more old than good. The cut to 2d. "all-the-way" was just the thing for a temporary measure. In the end, the really permanent policy was to build up a higher quality of service at a higher scale of fares.



**Glasgow lower-deck passengers are now literally riding on velvet. Only the corner seats are longitudinal**



**Glasgow upper-deck passengers now ride on leather seats and smoke if they like**

In America, ideas like these have to be sold to boards of directors; in Glasgow to a City Council of differing political and economic outlooks. For very many years the tramways had been such a handsome source of revenue to the common good that more than one councilor was aghast at the thought that profits had better be turned into moderization outlays if there were to be such contributions in the future. Other councilors less interested in tax reduction might object on the grounds of low-fare policy favoring the working-class riders. It will be seen, therefore, that the management had to be content with a slice of modernization in the hope that the rest of the loaf would be granted later.

But in April, 1927, the Council voted funds for the purchase of 50 new cars and the modernization of 150 cars, as will be told hereinafter. The system operates altogether some 1,100 cars, of which 500 have been in use since the electrification of the tramways in 1900! Modernization treatment is considered feasible for about 330 cars in all.

On April 26, 1928, the Council also decided to purchase 100 double-deck buses.

The modernization program, as will be seen, is not confined to the refitting of the cars but also to speeding them up. The average schedule speed of the Glasgow system is 9.3 m.p.h. The modernized cars have been remotored to give 10 m.p.h. The first few of these cars received were put in service about the system, more or less as an advertisement, but this did not give the desired opportunity of learning what the improvements could be made to mean in economy and higher earnings. Hence the required number were concentrated to care for all the Monday-Friday needs of the Uddingston route. Because of the higher schedule speed, it was found that 32 cars would do the work of 33. The riding public soon discovered that the cars were not only more luxurious, but saved six minutes running time. This discovery was prompt indeed, as proved by the jump in earnings from 15.84d. to 16.63d. per car mile, an increase of 0.79d. (1.6 cents) in the four weeks of June, 1928, compared with the preceding four weeks. Here is the way work was done.

The cars were carried on Brill 21-E trucks of 7 ft. wheelbase. These trucks were lengthened to 8 ft. wheelbase and equipped with one of three types of roller bearings—Hoffman sleeve, S.K.F. or British Bock (tapered rollers). These anti-friction bearings were installed without regard to possible saving of energy but solely to attain smoother riding. The lengthening of the truck and the installation of these bearings has stopped nosing or side play to such an extent that these double-deck cars can be operated up to 30 m.p.h. running speed with no such discomfort as was formerly experienced at much lower speeds.

To reduce noise, there was inserted a rubber strip $\frac{3}{4}$ in. thick by about $3\frac{1}{2}$ in. wide between the top of the truck frame and the side sills.

The substitution of high-speed, light-weight motors made it possible to lower the floor level, since 27 in. wheels now replace $31\frac{3}{4}$-in. wheels. The old motors were two Westinghouse 49-B rated 35 to 40 hp. Higher speed is now given by two MV-101 DR Metropolitan-Vickers

SCALE OF FARES FOR BUSES

| | Stages | Average Distance (Miles) |
|---|---|---|
| 1d. | 2 | 1.12 |
| 1½d. | 3 | 1.66 |
| 2d. | 4 | 2.22 |
| 2½d. | 6 | 3.28 |
| 3d. | 8 | 4.22 |
| 3½d. | 10 | 5.41 |
| 4d. | 12 | 6.62 |
| 4½d. | 14 | 8.03 |
| 5d. | 16 | 9.08 |

motors rated 50 to 60 hp. each. The higher horsepower is approximated in practice because the average line potential is 575 volts. The gear ratio is 13:62.

Twenty of these cars have also been fitted with contactor controllers including field control, whereby up to 40 per cent of the current can be shunted to permit a speed on the level of 28 m.p.h. instead of 22 m.p.h. The controller used is designated as the Metropolitan-Vickers OK-23B. The field shunt switch is brought into use only on the last parallel position. A relay prevents overloading of the motors.

The higher running speed of these cars is balanced by improvements in braking. For the first time, a group of Glasgow cars has been equipped with air brakes instead of depending on hand and short-circuiting brakes alone. These air brakes are used for all service stops except occasional trial stops with the hand brake. Still better emergency stops than before have been secured by the use of two sets of magnetic brakes instead of one. The brakes are reinforced by two sets each of pedal-operated and pneumatic sanders.

In past years car heating was unknown in Glasgow. The installation of various types of electric heaters is another novelty.

In line with this tendency is the complete inclosure of the upper deck. The canopy has been extended at each end and a pleasing glazed vestibule installed. Through the removal of superfluous gadgets elsewhere, the overhung weight has not been increased.

The change most apparent to the public is, of course, the reupholstering of the seats. The longitudinal seats on the lower deck have been replaced by a combination of cross-seats and short benches in the corners upholstered in moquette. As the Glasgow cars have a 6 ft. 10½ in. outside width and 6 ft. inside width, the transverse seats are double on one side and single on the other side. The cushion width of a double seat is 30 in. but the actual seat space is 35 in. The clear width of the aisle between the double and single seats is 15½ in. In the rearrangement of the lower deck, the number of seats was cut from 24 to 21.

The upper deck has fourteen cross-seats, seating 28 passengers, and longitudinal seats on the canopies for ten passengers. These have been retained through the simple substitution of genuine leather upholstering. It will be seen from an illustration that the seat-backs are not full, as is customary in American practice. In this way it is possible to avoid lengthening the seat spacing, which remains at 26 in. center to center.

The practice of designating each route by cars of certain color combinations has been retained, but for the benefit of strangers and of residents unfamiliar with a given route an improved form of roller destination sign has been adopted in place of the less conspicuous markers formerly used.

The foregoing improvements plus a number of constructional changes were made at an average cost of £1,000 per car. The job has been done on a maintenance basis with an average time of three cars per week.

Since the foregoing was written, the Tramways Committee has recommended (October, 1928) the acceptance of bids covering £183,215 ($890,425) of electrical equipment, brakes, roller bearings and upholstered seats for 300 re-conditioned cars.

## Who Will Receive the

# $200 Maintenance Prize?

AT A RECENT MEETING of the executive committee of the American Electric Railway Engineering Association it was decided that the awarding of the $200 individual prize in ELECTRIC RAILWAY JOURNAL's Maintenance Contest and the presentation of the company trophy and departmental certificates of merit will form part of the program at the general session of the engineers during next year's convention at Atlantic City. This will focus attention on the improved methods and equipment that are being originated by electric railway maintenance forces, resulting in better and faster work and decreased costs.

Send in your items for ELECTRIC RAILWAY JOURNAL's Maintenance Contest. You are sure of $5, as that amount is paid for each item published, whether it wins a prize or not.

There are twelve $25 departmental prizes to be awarded to individuals sending in winning maintenance ideas. These will be divided equally between the following four maintenance divisions: (1) Rolling stock and shops; (2) way and structures; (3) electrical and line; (4) buses and garages, including shop equipment for bus maintenance.

The most sought after prize of all will be the $200 individual prize to be awarded at next year's annual convention to the person submitting the best maintenance idea during the contest.

Don't delay in getting started! There is no limit on the number of items that may be sent in by one person. The more you submit the better chance you have of winning one or more of the big prizes. Some companies are organizing all maintenance departments to go after these awards. Look up the announcement in the Oct. 20 issue of the JOURNAL, or send for copies of the instruction folder!







# Interborough Rapid Transit Holds Public Exhibit of Its Safety Devices and Methods








1. Chief engineer's exhibit of feeder layouts, remote control circuit breakers, etc.
2. The signal department showed a great variety of equipment including automatic stops, track relays and signal lights.
3. The medical department showed its charts, forms, records and physical helps such as crutches and braces.
4. This is a general view of the exhibit held in a recently completed bay of the 147th Street shops.
5. The instruction car and the car equipment department's exhibit.
6. First all steel passenger car constructed.
7. The standard motor and trailer truck. There is one motor truck under every motor car and seven motor trucks under every ten-car train.
8. The final exhibit was of the transportation department.







# Interborough Exhibits Its Safety Equipment

**Devotes bay of its 147th Street shop to show features of car and track equipment—More than 4,000 persons attended during 22 days in October**

DURING October the New York public had an opportunity to study subway construction and operating methods first hand, particularly the precautions used to insure the safety of passengers.

Shortly prior to the Safety Convention, held in New York during the early part of October, the Interborough Rapid Transit Company was asked to co-operate by making an exhibit of its safety appliances. To do so it set aside one of the recently completed bays in its shops at Seventh Avenue and 147th Street, whitewashed the walls and staged an exhibit of which some views accompany this article. A large delegation from the Safety Congress was taken from the Pennsylvania Hotel, on 33rd Street, to the shops by buses on Oct. 5. The delegates were met by James S. Doyle, assistant to the general manager, and conducted around the exhibit, while representatives from the different departments explained the features shown. Later, the delegates were taken to the yards, where a demonstration was made on a train of some of the most important safety features of the equipment, particularly the automatic multi-side-door, the signal and automatic trip system and the dead man's button. A pamphlet, especially printed, explained and illustrated these and other fundamental features and gave some striking facts about subway safety. Thus, the statement was made that it is 22 times safer to be an I.R.T. passenger than to be on the streets of New York and six times safer than to stay at home. It has been calculated also that the average New Yorker, if he should travel continuously in the subway and should die only by accident, would live for 11,728 years.

The exhibit was so successful that the company decided to keep it open for very much longer than the period of the Safety Congress, and it remained open until Oct. 27. During that time it was visited by 4,349 people including several delegations from civic organizations, like boards of trade. The individuals included representatives from the police and fire departments of the city as well as company employees, many of whom visited the exhibit on Sunday, and all on their own time. Indeed, it was the first opportunity which most of them, particularly those in the clerical departments, had of obtaining a close view of subway equipment. Even some of the trainmen had never before seen the underside of a subway car with all the equipment mounted in place. This was possible at the exhibit because a standard car was raised high enough above the floor so that persons could pass under it, and the bottom was well illuminated with lights.

### The Exhibit Was Comprehensive

Space will not permit here of an account of all or even much of the apparatus displayed. A list of the different departments represented, with mention of a few of the things shown, will give an idea of the representative character of the exhibit.

The first exhibit on the right to greet the visitor was a full-sized model of the multiple-unit type of remote door control. All parts were distinctly marked, and a separate display showed the various relays and other of the larger parts employed. Next came a display of the safety posters used through the shops, then an exhibit of the purchasing department, with samples of its specifications and inspection reports and some of the articles purchased in which safety is a dominant feature, such as treads of subway stairs. A placard declared that the value of materials purchased yearly by the company amounts to $9,685,000 and that 22,000 orders are issued per annum.

The next exhibit was one of the lighting system used in the subway, and the next the safety features of the chief engineer's department. These latter related principally to the employment of remote control for power, on which articles have been published in these columns. This exhibit included views of the emergency and other equipment of a ticket agent's booth.

### First Steel Car Exhibited

At the end of the exhibit were three cars. One was a standard car, raised from the floor to a sufficient height to allow an inspection of its equipment. The second car was the first steel car put into use on the railroad. This car was built in 1903 and is now used as a pay and collection car. It is said to be the first steel passenger car ever to be put in regular service, as well as the first to be equipped with anti-climbing buffers. The third car on exhibit was the school car of the system.

On the left-hand side of the exhibit, adjoining the construction car, was a standard automatic tight-lock coupler and a pair of brightly polished wheels with axle and gear attached. Farther on were exhibits of the car equipment department, signal department, medical department and transportation department. In the center of the hall were a standard trailer truck and a standard motor truck.

During October the exhibit was open daily between 10 a.m. and 6 p.m. When advance information was received of the visit of an important delegation, arrangements were made whereby the visitors were received at the entrance of the administration building, and conducted through the shops to the exhibit room. Here the various exhibits were explained either by the heads of the several departments of their assistants. Then the delegates were taken to the demonstration track, where they were shown the operation of the track switch and dead man's button in regular subway operation.

# Southern Equipment Men Complete Convention Plans

ARRANGEMENTS have been completed to make the Rice Hotel, Houston, Tex., headquarters for the joint meeting of the Electric Railway Association of Equipment Men, Southern Properties, and the mechanical division of the Southwestern Public Service Association, to be held on Jan. 23-25, 1929, in Houston. Hotel rates for a single room with bath will be from $3.50 to $5 per day, and for a double room with bath, from $6 to $8 per day.

Due to the interest in bus operations, Robert M. O'Brien, president of the Association of Equipment Men, has requested that questions regarding bus operating difficulties be submitted for discussion at the convention, in addition to the questions on general railway operations.

# Convention Plans Discussed by A.E.R.A. Executive Committee

EXCELLENT facilities for an exhibit of street cars, buses and other local transportation equipment are to be provided for the next annual convention of the American Electric Railway Association. As announced in last week's issue of ELECTRIC RAILWAY JOURNAL, this will be held in Atlantic City, N. J., Sept. 28 to Oct. 4, 1929. A. H. Skean, manager of the Atlantic City Convention and Publicity Bureau, and L. G. Dickey, manager of the new Atlantic City Auditorium, explained in detail the facilities to be provided in the new auditorium, in connection with the statement of the convention location committee, headed by W. H. Sawyer, which made its report to the executive committee favorable to taking the 1929 convention to the New Jersey resort city.

### Ideal Facilities for Successful Car Exhibit

One problem which had given considerable concern to the location committee was that of providing suitable space for a representative exhibit of street cars at Atlantic City. This question involved not only the completion of arrangements for suitable space that would encourage manufacturers to send a representative exhibit of cars to the next convention, but also the matter of cost of such exhibits, which always was one that gave grave concern at Atlantic City. The arrangements completed by Mr. Skean and Mr. Dickey offered a very satisfactory solution to both of these problems.

The car exhibit will be arranged upon a great open plaza which is under construction on the beach in front of the boardwalk across the entire width of the new Auditorium building. Temporary tracks arranged in semicircular form across the ocean half of the plaza will provide space for approximately twenty cars in a location and setting highly advantageous to a successful exhibit. Special ramps from the tracks in the streets adjoining the Auditorium will permit the cars to be placed in position and removed after the convention with a minimum of labor. Arrangements have been made with A. J. Purinton, vice-president of the Atlantic City and Shore Railroad Company to assume the work of handling street cars from freight cars to the plaza and reloading them after the convention at a flat total price of $130 per unit, which would make the total cost of exhibiting cars in Atlantic City closely comparable with what it has been in Cleveland.

Within the Auditorium there will be space for housing the entire convention exhibit on one floor and in one room, with ample facilities for holding all meetings of the American and affiliated associations in conveniently located and comfortably equipped meeting rooms. After going over these facilities carefully it seemed to be the opinion of most of the members of the executive committee that the 1929 convention in going to Atlantic City will be held under almost ideal conditions.

Officers of the association were authorized to execute the contract which was prepared under the auspices of the location committee and which had already been signed by the proper representatives of Atlantic City. The dates for the convention provided in the contract are Sept. 28 to Oct. 4, inclusive, which is approximately one week later than the dates in Cleveland last year. Discussions which have ensued regarding objections to opening the exhibits on the Saturday preceding convention week had been reviewed by the locations committee, and were called to the attention of the executive committee. It was considered advisable to include the Saturday date in the contract, and the final determination of whether the convention will actually open on Saturday, Sept. 28, or on Monday, Sept. 30, will be referred to the convention program and exhibit committees. The locations committee likewise recommended that the program committee give consideration to the advisability of setting aside Monday afternoon and Wednesday mornings for the inspection of exhibits instead of the whole of Tuesday, as was done last year. In doing this it was felt that an inspection of exhibits on Monday afternoon, the first day of the convention, would be advantageous and do away with the need for opening the exhibit on Saturday. Furthermore, it was felt that by splitting exhibit day between a morning and an afternoon on different days, there would be a better opportunity for delegates with only a limited time at the convention, to go over the exhibits carefully and at the same time participate in the meetings of those associations in which they are particularly interested. Still another reason advanced in favor of this arrangement was that it would reduce the temptation to be absent from the convention which exists when an entire day is set aside free of meetings. By arranging the exhibit inspection on Monday afternoon and Wednesday morning, it was pointed out also that affiliated association meetings, starting on Tuesday afternoon, would run continuously for each of the three afternoons of convention week.

### New Committees to Make Broad Economic Studies

In addition to the discussion of convention plans and the discharge of routine business which occupied most of the time of the executive committee meeting, President Barnes announced the appointment of several important American Association committees to study broad phases of local transportation economics, somewhat along the lines of the work done by the rapid transit committee and that being carried out by the committee on street traffic economics. These new committees include a committee on the economics of interurbans, a committee on fare schedules and a committee on the co-ordination of public transportation facilities. In addition, there is to be a committee on co-operation with the industry in Canada. This program was approved by the executive committee. The thought behind the work of these new committees is that of a basic economic study of the several phases of community transportation in its broadest aspects.

E. F. Wickwire, sponsor of the manufacturers' luncheon during the last Cleveland convention, read a letter to President Barnes transmitting the suggestion made by resolution at the manufacturers' luncheon, for the appointment of a special committee of manufacturers to consider special manufacturing and trade problems within the industry. The executive committee passed a motion authorizing the president to appoint such a committee.

Those present at the executive committee meeting included President J. P. Barnes, J. H. Hanna, G. A. Richardson, L. S. Storrs, Barron Collier, R. P. Stevens, O. H. Bernd, L. F. Wynne, F. H. Miller, W. H. Boyce, A. S. Grenier, T. W. Casey, E. B. Meissner, E. F. Wickwire, D. W. Snyder, Jr., S. W. Shugg representing J. G. Barry, H. B. Potter, S. J. Cotsworth representing

Carroll Burton, E. D. Kilburn, W. M. Wampler, W. H. Sawyer, A. W. Brady, W. S. Rodger, F. W. Doolittle, Charles Gordon, C. L. VanAuken, J. W. Welsh, Labert St. Clair, E. J. Murphy, F. C. J. Dell, G. C. Hecker, J. A. Miller, Jr., J. A. Vignec. The next meeting is to be held on Friday afternoon, Jan. 25, at Indianapolis at the time of the annual meeting of the Central Electric Railway Association in that city.

# Virginians Discuss Utility Problems

MORE than 400 delegates representing almost every utility in the state of Virginia attended the annual meeting of the Public Utilities Association of Virginia, held at Roanoke on Nov. 21 and 22. Many interesting papers on utility relations with the public, investment banking views, urban transportation problems and rates were presented. Group luncheon meetings were held for the first time at this meeting of the association and, according to reports, proved very profitable. Another innovation was the formation of a woman's committee to assist and co-operate in all activities of the association.

Hon. William Meade Fletcher, commissioner of the State Corporation Commission, addressing the delegates at the opening session, spoke at some length on securing good public relations. He said in part:

Public utilities by high efficiency, better service and more progressive policies should make their commodities useful and necessary to the public and thus win its confidence and good will, for good public relations are of the utmost importance to the successful operation of public utility properties. The dissatisfaction which arises from poor service by the public utility is one of the most frequent causes of an unfriendly public attitude.

Commissioner Fletcher voiced his opinion with regard to public and private ownership by saying:

I am satisfied that as a general rule neither public ownership nor public operation is for the public's good nor desirable, and that private ownership and operation under proper regulation is the best system for conducting the business of public utilities.

The speaker stressed the need of proper employee attitude toward the patrons in establishing satisfactory friendly relations. He also mentioned the desirability of the utility securing more confidence on the part of the people in its good intentions and its desire to render good service. In support of this he said:

Instead of a policy of concealment there should be the policy of honest revealment, and when this course is pursued honestly, fairly and with no misleading propaganda, no distortion of facts, no concealments or evasions, and the public is fully taken into the confidence of the utility and made to understand the nature of its business, the cost of conducting it, the effect of restrictions placed upon it, the part it plays in the life of the community and its needs and necessities, then the utility has gone far to establish better relations between it and the public and the way has been paved for a sympathetic attitude on the part of the public to its necessary requirements.

### Views of an Investment Banker

Some aspects of the public utility business which are of major concern to investment bankers were reviewed by Henry R. Hayes, vice-president of Stone & Webster and Blodget, Inc., and former president of the Investment Bankers' Association of America. Mr. Hayes credited much of the stability of the public utilities to the efficient statewide regulations that have been responsible for the elimination of needless and destructive competition and that have prevented exorbitant rates. Supported by very uniform court decisions, he continued, this wise public policy of state regulation has afforded investors stability to such an extent that securities of the industry rank high among conservative investments. The speaker denounced those who were against state regulation and pointed out that their criticisms were general and without foundation. Mr. Hayes stated that more uniformity in commission regulation is essential to enable the operating companies to command a freer flow of money into the business for expansion.

The unfairness of charging only those who ride the cars and buses for the entire cost of financing and operating the transportation systems was pointed out by Tom P. Walker, vice-president Virginia Electric & Power Company. To use Mr. Walker's own words:

Public transportation for people in mass is an absolute necessity for any city grown beyond the "one-horse" class. The butcher, the merchant, the manufacturer, the home owner and the worker are dependent on it directly. As a necessity this service is found to be supported, and we therefore have before us the definite problem of how to assess against each element of the population the cost of the service which that particular element enjoys. Under the theory established by many years usage, and at present in vogue, he who actually rides the cars and buses is expected to carry the entire cost. Franchises to operate transportation systems now require expensive hard surfaced streets which car riders are forced to pay for and which are of no direct benefit to them.

The speaker analyzed in part some of the traffic ordinances and suggested that provision be made for the speeding up of transportation vehicles. On this subject he said:

If we are to halt the tremendous expenditures for widening streets to causeways and subways, we must certainly contrive to encourage the use of the more efficient bus or street car by allowing it to operate at an average speed, comparable with that of the automobile.

Other addresses delivered before the association included "The State Conservation and Development Commission," by Hon. William E. Carson, chairman of the State Conservation and Development Commission; "Your City and Your Business," by Colvin Brown, manager Commerical Organization Department of the United States Chamber of Commerce; "Fundamental Rate Base," by N. M. Argabrite, vice-president of the American Gas & Electric Company; "Industrial Development in the New Virginia," by J. P. Fishburn, president Virginia State Chamber of Commerce, and "Whither Public Utilities?" by Alexander Forward, managing director American Gas Association.

Three group luncheons were held during the noon hour of the first day. The groups were divided as electric light, power and telephone; transportation; and gas and water. Much interest was shown in a demonstration of "Televox," the Westinghouse mechanical man.

### Women Form Auxiliary

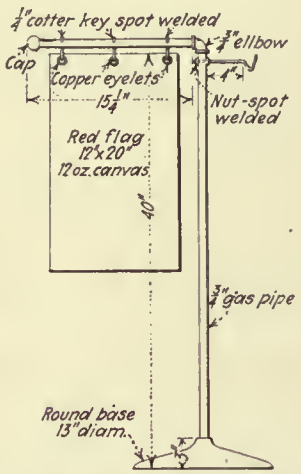
The ladies in attendance at the convention met and formed an organization to work in conjunction with the association. Officers were elected and a definite program outlined. Several entertainment features were planned for the ladies in attendance, including a sightseeing tour, a luncheon, a bridge tournament and a buffet supper and dance.

A. W. Higgins, executive vice-president of the Virginia Public Service Company, Charlottesville, Va., was elected president of the association for the coming year. The vice-presidents named were C. B. Short, manager Roanoke Railway & Electric Company; T. Justin Moore, vice-president and general manager Virginia Electric and Power Company, and Herbert Markell, division manager Appalachian Electric Power Company.

# Short Cuts to Better

## Sign Boards and Standards Improve Public Relations

AS A PART of its program to improve public relations the Northern States Power Company, Fargo, N. D., uses an attractive type of flag and lantern standard and a distinctive sign board. The flag and lantern standards are used at all




**Type of standard used for red flag and red lantern display by the Northern States Power Company, Fargo, N. D.**

obstructions in the streets. They are a distinct improvement over the red flag as displayed on a staff. With the new type of standard the flag is plainly visible at all times. A hook is provided for the lantern so that this is displayed much better. The neat arrangement of the standard also makes a better display of the work under way.

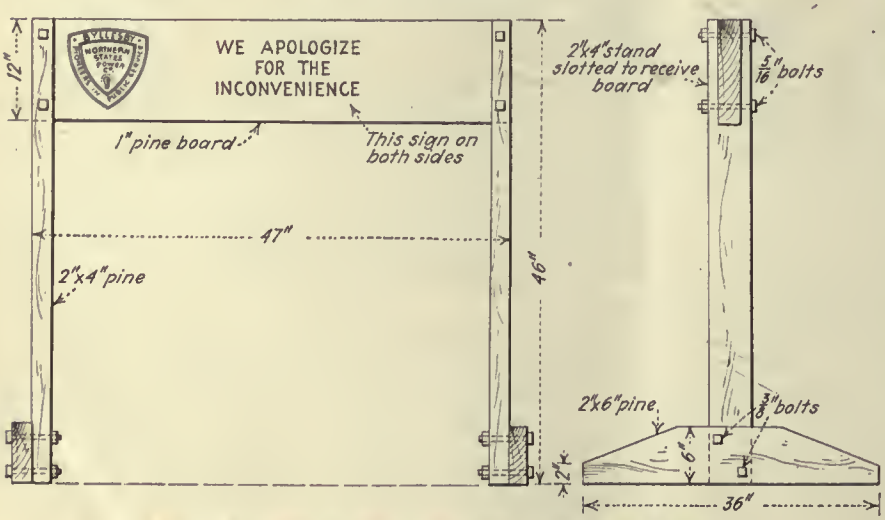
Sign boards are used on all work which in any manner may inconvenience the public. The top reads "We Apologize for the Inconvenience." The sign also bears the seal of the Byllesby organization. Many favorable comments have been received in regard to their use.

## Painting Notes from Vienna

PLANS of the Vienna Tramways include the building of a cabinet for painting two cars at a time with nitro-cellulose paints. Compressed air will be introduced at the top of the enclosure with ample suction at the bottom so that the rapid carrying off of gases will make it unnecessary for the spray painters to use masks. The experimental cars will be treated in part with Duco and in part with a German product called "Glasurit," made by the Glasuritwerke of Hamburg.

For wooden surfaces, the management has under consideration a lacquer oil paint which will permit a car to go through the shops in six days instead of twenty-one, a very considerable saving.

Spray painting has already been applied on signs with stencil lettering. The stencil pattern is magnetized to stick on the plate during the spraying. After drying, the lettering can be brought up to enamel polish.

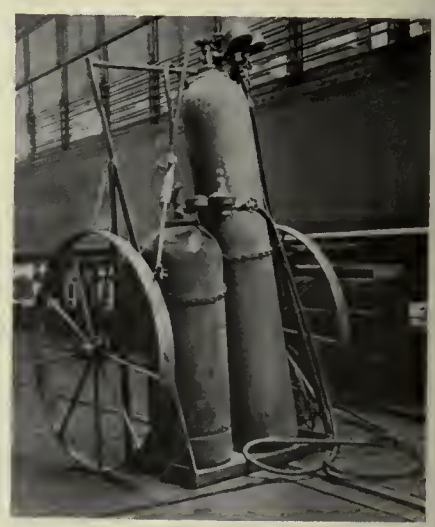



**Sign board used on work which may inconvenience public**

## Large Wheels on Welding Truck

WHEELS of 10-in. diameter and 2-in. face were used originally on the acetylene outfit truck in the shop of the Richmond Railways, Inc., Staten Island, N. Y. When this outfit was taken about the shop as well as about the yard and inspection shop, trouble was experienced continually in moving it over small floor imperfections, rails, etc. In consequence, the services of two men were very often required to transport it. As this was expensive the truck shown in the accompanying engraving was designed and constructed.

The novel feature of this truck is in the diameter of the wheels used



**Large wheels on this truck make it easy to roll over obstructions**

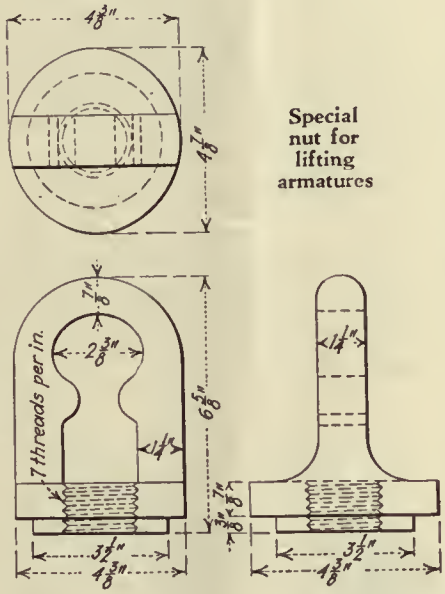
and the fact that the wheels are raised from the floor when the tanks are in a vertical position. The platform is 24x14 in. and is made with a ¼x2-in. angle framework and ⅛-in. floor plate. The joints of the plate and angles are welded. Two ¼x1¼-in. vertical angles 39 in. high are welded to the back corners of the platform. Two ¼x1⅛-in. flat bars welded to each front corner of the platform extend backward to meet and project beyond the two rear vertical angles. A ¾-in. round rod, welded to the upper end

# MAINTENANCE

of these flat bars, provides a handle for moving the truck. Each front flat bar and back angle is welded at the meeting joint.

A 1¼-in. square axle is welded to the vertical angles 15¼ in. from the bottom of the platform. These axles are fitted with iron wheels of 30-in. diameter and have rims ¼ in. thick and 2 in. wide. The wheels are spaced 40 in. apart. When the truck is resting on the platform the wheels are ¼ in. off the floor. This prevents movement of the truck when unattended. A ¼x1¼-in. angle welded to the vertical angles strengthens the framework and provides a support for fastening the tanks.

This truck can be moved by one man and has thereby increased welding production and decreased labor.




Special nut for lifting armatures

## Lifting Armatures with Pinion Nut Thread

THERE is always a possibility of an armature being damaged during its installation or removal from a field frame. Unless the utmost care is exercised, maintenance expense will be increased. The cars of the Staten Island Rapid Transit Railway, Staten Island, N. Y., are equipped with G-E, 282-A box frame motors. Several methods were tried for applying and removing the armatures from the field frames, and it was finally decided to perform this work with the frame in a vertical position. Motors are placed on the floor with the pinion end up, and the armatures are applied to or removed from the frame while in this position. The armatures are lifted by a special lifting nut designed and made in the shop.

This nut is screwed on to the shaft pinion nut thread. It is a steel forging with an oval base 4⅜x4⅞ in. and an over-all height of 6⅝ in. The base is ⅞ in. thick and the diameter of the eye is 2⅜ in. The base is designed with a projection ⅜ in. thick and with a 3½-in. diameter. The thickness of the eye material at the top is ⅞x1¼ in. and at the base 1¼ in. The oval base and its projection are drilled and tapped to fit the pinion nut thread.

This method has been in use for some time and although the armatures weigh 1,650 lb. not a single accident has occurred.

## Convenient Route Number Sign


By A. M. Lindsay

*Superintendent of Rolling Stock*
*Montreal Tramways, Montreal, Canada*


SEVERAL advantages are claimed for an inexpensive, adjustable type of route number sign used by the Montreal Tramways and shown in the accompanying illustrations. The principal features of this sign are:

1. Each curtain can be adjusted separately for position, giving a wide range of numbers. A coil spring on the curtain rollers keeps the face of the curtain tight and in the position where it is placed.

2. The back of the holder is of glass, so the route number is illuminated at night from the general car lighting.

3. A self-locking spring catch keeps the back cover tight and prevents rattling.

4. Curtains are inclosed completely and are kept clean and free from dust.

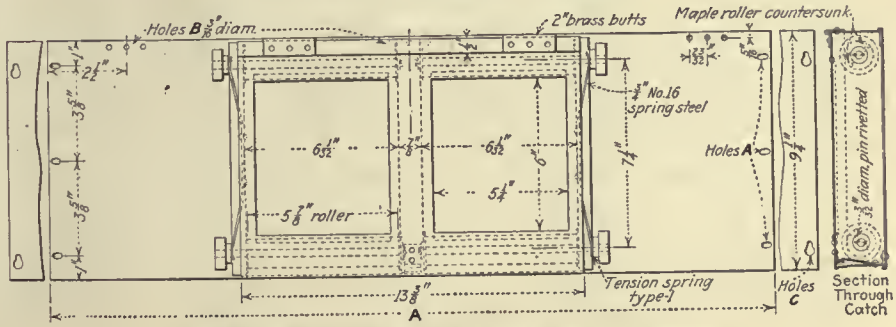
5. Slots in the ends of the case enable it to be placed in or removed quickly from suitable brackets on the window posts when repairs are necessary.

The cost of a complete sign is small, being approximately as follows:

| | |
|---|---|
| Sign case | $3.00 |
| Sign brackets and application | .25 |
| Sign curtains | 1.00 |
| Total | $4.25 |




At left—View of the sign from the interior of the car.
At right—Exterior view of the sign




Construction of route number sign as used in Montreal

# Helpful Equipment Suggestions

## Powerful Type Concrete Breaker

FOR BREAKING concrete of heavy and difficult construction, a new type Sullivan K-3 concrete breaker is announced by the Sullivan Machinery Company, Chicago, Ill. This compressed air tool weighs 84 lb. and employs a cylindrical hollow valve for imparting the impulses of air to the piston. In the usual type



New type of concrete breaker

of service, air economy and excellent stand-up qualities are claimed for this machine as well as great power and penetration.

## New Solder for Railway Motors

By James Silberstein
*Chicago, Ill.*

SOLDERS for electrical apparatus generally consist of lead and tin and start to melt at a temperature of 183 deg. C. A solder of higher melting point is desired for apparatus where the service is severe and high temperatures are encountered. Pure tin, which has a melting point of 232 deg. C. has therefore been used. The advantage of using pure tin is, however, not very marked and it has the disadvantage of being difficult to solder on account of its fluidity and tendency of "running through" joints.

Attempts have been made to develop new solders, standing higher temperatures, but they have so far been unsuccessful because of the rather severe requirements which have to be met by solders for electrical apparatus. Recently, however, an alloy has been developed which has proved its usefulness as a solder under very severe conditions. This alloy consists of lead as a base metal with additions of silver and copper, and starts to melt at a temperature of 302 deg. C. The alloy can be used in soldering with the non-corrosive fluxes, ordinarily employed in the soldering of electrical apparatus, and can be worked with a common soldering iron, which, of course, has to be heated to a higher temperature than when soldering with the ordinary lead-tin solders.

The new solder was put in service, and used successfully, on the electric motors of the locomotives of the Virginian Railroad. It was developed by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

## Floodlight Attachment



Floodlighting unit attached to tank

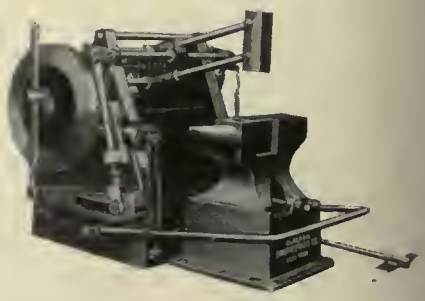
FOR USE with small tanks of dissolved acetylene the Prest-O-Lite Company, Inc., New York, N. Y., announces a floodlight attachment of new design. By the connection of the attachment a convenient, portable, powerful floodlighting unit is obtained which can be used for illumination in dark places and for facilitating night work of all kinds.

The improved attachment is of simple, strong, rigid and compact construction. Universal adjustment is obtained with only one swing joint, thus minimizing the possibility of leakage. Because of the substantial construction of the new part and because of its position near the center line of the tank, the attachment itself can be used as a handle in carrying the entire unit.

The reflector, which is of 10-in. diameter, can be taken off by removing a single knurled nut. A new type of burner is used which will not "carbon up." This burner is placed at a fixed focal point and requires no adjustment.

## Improved Smithing Hammer

SEVERAL improvements are incorporated in the new Blacker "B" blacksmith hammer, recently placed on the market by the Blacker Engineering Company, New York, N. Y. While retaining the features



Improved type of blacksmith's helper

of preceding models, it is a larger and heavier machine throughout. Along with numerous dimension changes, thrust bearings are fitted to ease up the control mechanism, and a complete rearrangement of the motor drive gives a neat and compact unit.

A smith working at an anvil equipped with the improved hammer has directly under his control a sturdy, tireless helper swinging a sledge that can strike a blow three or four times as heavy as that of the hand swung sledge it replaces. He no longer has to signal with a small hand hammer to his strikers, and all confusion and misunderstanding are eliminated. The smith merely presses down the treadle with his foot and the sledge swings up and down exactly at the spot on the anvil that the smith selects and with his foot control he regulates the blow.

The control of the blow is positive. It passes from the treadle and chain through reduction gearing to the worm and quadrant action moving the quadrant arm. This is the same principle as the automobile steering gear and motion and shock from the working parts cannot carry back to the operator. The slipper in the link-motion drive is at dead center, or neutral, while the link itself rocks up and down with the eccentric action of the fly-wheel. Exactly like the locomotive drive, any movement of this slipper through the link results in a proportionate up and down motion of the driving rod, which in turn sets in motion the carriage and its hammer arms and head.

# News of the Industry

## May Have to Increase Its Fare

An increase in street car fare in Cleveland, Ohio, is considered probable as a result of a drop in the interest fund of the Cleveland Railway below $500,000 during the months of September and October.

The Tayler grant states that a drop in the interest fund below $500,000 shall be considered as *prima facie* evidence of the necessity for an increase. The present rate in the city is 7 cents cash, eight tickets for 50 cents, with a 2-cent differential in East Cleveland and similar differential about to be enacted for Cleveland Heights.

The interest fund stood at $468,397 on Sept. 30. Officials of the railway expected that the seasonal increase in riding would build up the fund during October, but on Oct. 31 the balance was $468,139, according to reports made to the directors at their monthly meeting on Nov. 22.

The directors, however, made no move to bring about an increase in the rate of fare, believing that there will be a recovery in the interest fund during the winter.

## Forward Step in Traffic Solution in New York

Mayor Walker, of New York City, has suggested that the Board of Estimate engage the professional services of Day & Zimmermann, engineers, to make a survey of the city's traffic conditions. Such was the central recommendation of the report of Mayor Walker's citizens' committee, and the Mayor himself has recently taken steps to carry it out. This commission would deal with all matters connected with the city's growth, and would naturally have much to say about the causes of congestion and its remedy. Distribution of population, balance of industry, recreational facilities, bridges, by-passes, arterial highways would be studied thoroughly.

## Ordinance for Electric Power in Atlanta Abandoned

The attempt of the city of Atlanta, Ga., to compel railroads in its downtown district to use electricity as a source of power has been abandoned, at leat, for the time being. This became certain when the proposed ordinance, which would have made it a misdemeanor for any locomotive to "emit coal smoke or cinders" within the fire limits of the city, and compelled all railroads operating in the city to use electric locomotives, was withdrawn by its author, Alderman W. Guy Dobbs.

In withdrawing his ordinance, which already had the approval of a majority of the City council, Mr. Dobbs stated that it provided for the electrification of the railroads by Jan. 1, 1929, and that this was now a physical impossibility, due to delays in holding hearings and getting definite action on the proposition.

One hearing was held, after which the bridge committee, to which the ordinance was referred, asked that a special committee be appointed to study all phases of the city's smoke problem. The committee was appointed, and an ordinance had to be introduced giving it legal authority. Thus far the authority measure has not been presented to the Council.

After the special smoke committee makes its report it is probable that a new ordinance will be drawn up following its recommendations.

## Telling Them How and Why in Nebraska

### Management and employees of Omaha and Council Bluffs Street Railway show what a well-knit organization with perseverance and purpose can do for the common weal

DEEP gratitude has been acknowledged by the management of the Omaha & Council Bluffs Street Railway and the employees to the people of Omaha, Neb., for their award of the franchise which has been regarded as not only a vote for the franchise but "as a vote of confidence in the company and its employees." Through *Street Car Topics*, published by the company, the railway promises to prove worthy of the confidence.

The expiring franchise in Omaha was one of the problems which faced John N. Shannahan when he went to Omaha a year ago to re-establish the credit of a sick railway organization. In the emergency a large bond issue had either to be retired or extended. Arrangements were made with the bondholders whereby the expiration date was extended, pending an effort to secure a new franchise, and the management set about preparing the way to consummate that object.

An unusual means of taking his message to the public was conceived by President Shannahan in enlisting the aid of his platform men. From the ranks of the train service ten representatives were selected during August, and were given a course in public speaking under the direction of a competent instructor. The men were supplied with a prepared speech, setting forth their own and the company's position with regard to the proposed franchise and were required to memorize it, with such changes as would fit in best with their own command of the English language. Within a few weeks the speakers felt competent to make their first appearances.

The ten trainmen during the preliminary training period worked only part time on their cars and were compensated for all time lost. After the campaign got well under way they were relieved from their duties on the cars entirely, were furnished with brand new uniforms, which they were required to keep in first-class condition, were paid something more than their regular wages and were supplied with liberal expense accounts. They were now ready for an assault upon the luncheon clubs, the various local group meetings and any and every place where a suitable audience could be prevailed upon to listen to their argument.

After the regular list of luncheon clubs had been subjected to their oratorical fire the field of operations was broadened to include lodges, trades unions, business colleges and the like. One of the men appeared before the Omaha Women's Club, where he was well received and made a decided hit. Afternoon and evening card clubs were invaded.

### To the People of Omaha

ON ELECTION day by a vote of 60,600 to 17,348, you gave us a franchise to continue to do business in the streets of Omaha.

The franchise was necessary for us to continue in business. The company's 1,100 employees, and the company itself, wish to acknowledge through *Car Topics* their deep gratitude to the people of Omaha.

However, we regard the fine vote as more than a vote for the franchise. We regard it as a vote of confidence in the company and its employees.

It is and will be our purpose to prove ourselves worthy of this confidence. We have been and are, to the best of our ability, giving efficient and courteous transportation service. Our purpose is to make this service constantly better. We welcome suggestions from the people of Omaha.—*Street Car Topics*, published by the Omaha & Council Bluffs Street Railway.

During the final month of the campaign the scope of the meetings was broadened so as to cover many of the city's leading industrial establishments, department stores and factories. On one occasion the Union Pacific Railroad gathered 1,300 of its employees during working hours and allowed the trolley company's representatives twenty minutes in which to talk to them. Some of the trainmen made as many as four speeches a day. On Friday and Saturday immediately preceding the election two men went on the radio with their talk and in this manner reached hundreds who had not previously been addressed. In all, this group of trainmen addressed over 200 gatherings and spoke to an estimated total of 18,000 people.

### Women Not Overlooked

On election day, in addition to two men in uniform at each of the 176 precincts in Omaha and Council Bluffs. there was one woman, the wife, sister, mother or sweetheart of some male employee, each wearing a ribbon labeled "Street Railway Employee."

In spite of active opposition, led by United States Senator R. B. Howell and supported by a considerable and active element in both cities, the franchise carried by a vote of 60,600 in favor as opposed to about 17,000 against. The motion for the proposed free bridge over the Missouri River was defeated, but by a vote somewhat less decisive.

As the result of the election and of the spirit which was aroused among its employees the Omaha & Council Bluffs Street Railway finds itself with a 30-year franchise, with its credit restored, and with the way cleared for the sale of its toll bridge to the city, instead of a threat to build a free bridge in competition. The company can now proceed to carry out its long delayed plans for securing new rolling stock, constructing new substations and rehabilitating certain of its cars. Immediate results have been the engaging of experts to conduct a traffic survey, which is expected to result in a number of changes for the better in the routing of its cars, and a group insurance arrangement whereby each employee is given a life insurance policy for $1,000, the premium of which is carried by the company.

Above everything else that the company counted as gain as the result of its campaign for the franchise, was the strengthening of the morale of its entire force of employees. This was especially true of the train force. Not only did they take a new pride in themselves and in their vocation but they raised themselves in the estimation of the general public. In the eyes of the business community the trainmen are something more than mere automatons; their entire status has been improved. As one observer sees it they have won for themselves a new prestige. They have shown the people of Omaha and of Council Bluffs that they are a power to be reckoned with in the community. By their efforts they have established the company upon a new and improved basis. It is now in position to go forward and do its full part in the development of these growing cities. It is freely admitted that without the whole-hearted support of the employees this happy result could never have been accomplished.

## Snag in Decatur's Argument

Five of the six judges on the Supreme Court of Georgia have declared themselves disqualified for consideration of litigation between the city of Decatur and the Georgia Power Company over Decatur's 5-cent fare contract, and argument has been postponed. Judge Marcus W. Beck was the only member of the court who declared that he was qualified to hear the case. Both sides were willing to waive the disqualifications set up by the other justices, the reason for which was announced as ownership of stock in the company by near relatives, which operates as a bar under the law, but the judges themselves refused to sit in the case.

The case involves a franchise entered into by the city of Decatur and the Georgia Power Company in 1903 for the taking over of the Decatur street car line. It has been the center of litigation for a number of years. A clause in the contract provided that Decatur should never be charged more than a 5-cent fare. Abrogration has been sought in vain through both court channels and legislative enactment, and on two occasions the case has come before the United States Supreme Court.

The present litigation originated in 1925, when the company notified the city of Decatur that it had surrendered it franchise and would remove its tracks. The city then secured and injunction in the De Kalb Superior Court, and this decision is before the Supreme Court of the state for review.

# Akron Set to Negotiate New Franchise

**Committee turns in report in which it finds 7.7-cent are necessary. Present average fare is 6.51 cents. Buses and cars each carry about 20,000,000 a year**

THE Citizens' Fact Finding Committee at Akron, Ohio, selected to study the city's transportation system, has presented its report to Council, after several months' work. The committee finds that a fare of 7.77 cents is necessary if the Northern Ohio Power & Light Company is to receive a rate sufficiently high to pay operating expenses, maintenance, depreciation and taxes, and a 7 per cent return upon the valuation of the property.

Filing of the report with Council marks the first step in the negotiations between the city and the company for a franchise to take the place of the temporary franchise which expires in February.

Under the present franchise the company is getting an average fare of 6.51 cents, the reports shows. The present fare is 7 cents cash, four tickets for 25 cents, and seventeen tickets for $1. The committee does not recommend an increase in fare to the figure named in the report, upon the theory that a heavy decrease in riding would follow to a point which would give the company only a 3 per cent increase in actual fare. The increase necessary to pay all charges is 18 per cent.

The committee made a study of 25 cities throughout the United States. In cities where the fare has been increased steadily over a period of years, the gross revenue of the company, the report declares, has remained almost stationary instead of increasing. In other words, as the fare went up, the number of riders went down.

The report presents to Council six valuations. These valuations range from $6.262,364, arrived at by the historical cost less depreciation reserve method, to $8,643,207 valuation arrived at by the reproduction cost less retirement only method.

That the automobile has provided the most relentless kind of competition for transportation companies is shown in figures on auto ownership for Akron. The report discloses that there were 13,600 automobiles in the city of Akron for 1918, or one for each 13.75 persons. In 1928 there were 63,566, or one auto for each 4.75 persons.

### Remarkable Growth of Bus Business

Other outstanding points in the report show that on the basis of present fare, net revenue of the company is showing marked improvement for 1928. The bus system, started in 1922, will carry more passengers in 1928 than the street car system. The first year the company operated buses it carried 2,004,297 passengers as against 33,894,113 on the street cars. In 1927 the buses carried 19,038,134 persons while street cars carried 20,519,101. By the close of 1928, the buses will have carried several hundred thousand more passengers than the street cars for the year. The street car system is shown to be on a sound economic basis, but losses pile up on bus operation. Drastic economies on the bus system are suggested to aid in solving the transportation problem. In striking an average, the committee finds that the reasonable net revenue for the year should reach $3,230,992 to pay operating costs, taxes, interest on bonds, dividends and provide fair depreciation reserve.

The report shows that there was $187,014 applicable to depreciation and return in 1927, and that in 1928 the figure will reach $224,654. This amount should be $723,393, to put the trans-

portation property on a justified earning basis.

The report contains 150 pages and goes into the transportation system in an exhaustive manner. Besides the summary, written by Harold McGee, director of the bureau of municipal research, the report includes a section on court decisions on valuation and rate of return of electric railways by Edwin W. Brouse, attorney. Mr. Brouse is secretary of the committee. The report also contains an analysis of franchises by legal members of the committee. It contains an accounting study, by H. C. Miller, L. W. Dalton, and William L. Post; an analysis of prior appraisals, by Post; the physical appraisal of the company, by Prof. Henry Riggs, appraisal expert of Ann Arbor, Mich.; a historical cost of the system, by Post; capital securities, by H. C. Miller; an analysis of operating incomes and expense, by Mr. Dalton, and a section on the economics of car and bus fares, by H. L. Newhall. It is expected that negotiations for the new franchise will begin during the week beginning Dec. 2.

The Northern Ohio Power & Light Company, the city officials, the committee of citizens, and the newspapers are urging an early settlement.

## Small Town Problems to Be Studied

Difficulties of electric railways in small towns and what can be done to alleviate them will be the subject of study by a committee of the American Electric Railway Association during the coming year. This committee on "small town operation," of which A. C. Spurr, general manager Wheeling Traction Company, is chairman, met at association headquarters on Nov. 26. The subjects to which particular attention will be paid are method of financing new car purchases, relief from paving burdens, possibilities of reducing the cost of purchase power and the conditions which may make it desirable to substitute buses in place of cars on small systems. Members present at this meeting were: A. C. Spurr, chairman; J. S. Bleecker, L. F. Gillett, A. H. Gossard, L. W. Heath, William M. B. Lord, C. A. Meyer, F. A. Persons, C. W. Stocks, representing R. E. Plimpton and J. H. Pritchard.

## Chicago Honors Fallen Heroes

Electric transportation companies serving Chicago and the entire metropolitan area joined in paying tribute to the nation's fallen heroes on Nov. 12, when the tenth anniversary of the signing of the Armistice was generally observed. Traffic came to a complete halt for one minute at 11 a.m., on the Rapid Transit Lines, the Chicago North Shore & Milwaukee Railroad, the Chicago South Shore & South Bend Railroad and the Chicago, Aurora & Elgin Railroad while the employees of the four companies faced east in silent tribute to the dead.

Buglers from Chicago Elevated Post No. 184, American Legion, sounded taps from four "L" transfer bridges in the Loop just as traffic came to a halt at 11 o'clock. All rapid transit cars and the transfer bridges on which the buglers are stationed were decorated in the national colors.

## Midwest Association Meeting Scheduled

Plans have been made to hold the midwinter meeting of the Midwest Electric Railway Association at the Robideaux Hotel, St. Joseph, Mo., on Feb. 7 and 8.

### COMING MEETINGS OF *Electric Railway and Allied Associations*

*Dec. 3-7* — **American Society of Mechanical Engineers, 49th annual meeting, 29 West 39th St., New York, N. Y.**

*Dec. 7* — **Metropolitan Section, American Electric Railway Association and Metropolitan Section, Society of Automotive Engineers, joint meeting, 33 W. 39th St., New York, N. Y.**

*Dec. 10-12* — **National Highway Traffic Association, annual meeting, Automobile Club of America, New York, N. Y.**

*Jan. 14-18, 1929*—**American Road Builders' Association, convention and road show, Cleveland, Ohio.**

*Jan. 22*—**New York Electric Railway Association, mid-winter meeting and dinner, Hotel Commodore, New York, N. Y.**

*Jan. 23-25*—**Electric Railway Association of Equipment Men, Southern Properties, and Southwestern Public Service Association, Mechanical Division, joint meeting, Houston, Tex.**

*Jan. 24-25*—**Central Electric Railway Association, Claypool Hotel, Indianapolis, Ind.**

*Jan. 25-26*—**Central Electric Railway Accountants' Association, Claypool Hotel, Indianapolis, Ind.**

*Jan. 28-Feb. 1*—**American Institute of Electrical Engineers, annual convention, 33 W. 39th St., New York, N. Y.**

*Feb. 7-8*—**Midwest Electric Railway Association, Midwinter meeting, Robideaux Hotel, St. Joseph, Mo.**

*Feb. 14*—**Central Electric Railway Master Mechanics' Association, Youngstown, Ohio.**

*Sept. 28-Oct. 4*—**American Electric Railway Association, 48th annual convention, New Public Auditorium, Atlantic City, N. J.**

## Engineering Executive Committee Meets in New York

Completion of the personnel of all standing and special committees of the American Electric Railway Engineering Association, with the exception of one or two committees in the Purchases and Stores Division which are expected to be completed in the near future, was announced by President F. H. Miller at a meeting of the Engineering executive committee held at association headquarters in New York on Nov. 22.

Progress in the work of the committee on revision of committee rules was reported by W. W. Wysor. The secretary reported approval by letters ballot of the following committee reports: way and structures—committee No. 4, track ballast and drainage; committee No. 5, wood preservation; committee No. 6, arc welding; committee No. 7, alloy steels for special trackwork; power—committee No. 5, catenary specifications; committee No. 7, radio interference; committee No. 12, ferrous versus non-ferrous materials for overhead lines; rolling stock— committee No. 1, engineering manual; committee No. 5, bearings; committee No. 6, lubrication; committee No. 9, noise reduction. In addition to these, the reports of way and structures committee No. 11 on track construction, No. 14 on rail markings, and No. 16 on special trackwork foundations, were approved at this meeting of the executive committee. The reports of way and structures committee No. 2 on special trackwork and No. 8 on track pavement were referred back to these special committees.

Time limits for the completion of all special and standing committee reports were established. Progress in co-ordinating the work of the several associations engaged in the study of the various phases of heavy electric traction was reported. A recommendation by the committee of judges in the Electric Railway Journal Maintenance Contest, that the annual company award, the individual capital prize and the departmental certificates of merit be made a part of the general engineering sessions at the convention was approved. P. V. C. See was appointed to represent the association in a proposed conference on a uniform motor bus specification code. A report was made that negotiations are still under way for a conference with representatives of the National Machine Tool Builders' Association looking to a study of the economies to be obtained by application of modern shop machinery in the electric railway industry.

Those in attendance at the meeting included President F. H. Miller, presiding; F. McVittie, C. H. Jones, P. V. C. See, W. W. Wysor, H. H. George, E. M. T. Ryder, H. F. Brown, A. T. Clark, C. R. Harte, Charles Gordon, C. L. Van Auken, A. W. Baker and G. C. Hecker. President J. P. Barnes of the American Association visited the meeting for a brief period to explain proposed changes in the convention program designed to facilitate the work of the affiliated associations.

# Detailed Traffic Survey Planned

## Executive committee of Philadelphia Chamber of Commerce endorses suggestion of Mitten Management to go thoroughly into matter

MITTEN MANAGEMENT'S offer to make a detailed survey of traffic conditions in Philadelphia and to prepare a complete city traffic plan, was accepted on Nov. 27 by the executive committee of the Philadelphia Chamber of Commerce. The offer of the management, which operates the Philadelphia Rapid Transit Company, to undertake a study of local conditions was made several days earlier by Joseph A. Queeney, vice-president of Mitten Management in charge of operation.

Need for treatment of this kind for the traffic problem has long been felt in Philadelphia and there have been periodic agitations for a comprehensive engineering survey of street conditions and requirements throughout the metropolitan area. Mr. Queeney, in presenting the plan of Mitten Management to the executive committee of the Chamber of Commerce, pointed out that his organization has had fifteen years of experience in giving transportation service over the city streets and that no group of engineers could come into Philadelphia and secure the facts or acquire the knowledge possessed by the transportation management, without long and intensive study.

It was proposed that this wealth of information be gathered together, supplemented by studies of the immediate conditions, shaped into a practical plan and subjected to the comment and criticism of every individual or organization that may be in the slightest way affected.

The plan will embrace city-wide traffic control, including the operation of all public vehicles; a parking plan; a scientific signal light system; the construction of new streets or the widening of others if found necessary and practical; the elimination of grade crossings; the study of accidents; and everything else that in any way involves the right of the citizens to obtain the safest and most convenient use of the streets. Among other things Mr. Queeney said:

Our plans have been developed to the point where we now need the co-operation of the business men of our city. We want, for example, to have several merchants conduct checks at their stores and places of business, so as to develop just how their customers reach their places of business. Do they come by private automobile, leaving their cars parked at the curb, or do they park in some nearby garage; or do they come by subway, surface car, bus, or taxicab, or do they walk? Once these facts are determined to the satisfaction of the merchants, we will have no difficulty in deciding whether it is necessary to have our valuable street space occupied by parked cars. If it is true that parking cars on our public streets is necessary, or desirable, then we will provide for such parking in our plans of traffic control.

When this plan of ours is completed we suggest that you call in the representatives of every interest affected, and let them measure it by their own problem. That goes for the motorist organizations, the trucking companies, the steam railroads, the city highway department, the utilities which have conduits in the city streets, the merchants, the manufacturers, etc. Traffic relief means so much to all of these people that a comprehensive plan, satisfactory to all, should quickly be arrived at as a substitute for the chaos existing today. Then, with your endorsement (the endorsement of the executive committee of the Chamber of Commerce) the plan will be submitted to the Mayor's traffic commission.

At the time that the Chamber of Commerce group approved the suggested plan of Mitten Management, it also recommended that members of the City Council should investigate traffic conditions in other cities at first hand. The resolution approved by the committee was as follows:

The traffic committee of the Philadelphia Chamber of Commerce has repeatedly urged that a comprehensive survey of the traffic conditions in Philadelphia should be made by an independent traffic expert, to be employed by the city. However, as the city has failed to provide the funds to employ such an expert, we approve the offer on the part of Mitten Management, Inc., to make a survey and, when completed, will give it careful attention."

## Denver Employees Pay Election Bets

SOME of the employees of the Denver Tramway, Denver, Col., who voted for Governor Al Smith, were forced to wait until the first snow storm to pay their losing bets. Accordingly, on Nov. 17, attired in straw hats and with corn cob pipes in their mouths, they straddled broom sticks and raced down Sixteenth Street waving banners which explained what it was all about. They insisted that "We are still for Al."

## Would Restrict Parking in Chicago

In an effort to speed up traffic during morning and evening rush hours an ordinance has been drawn for presentation to the City Council of Chicago which would restrict parking to only one side of the street on all thoroughfares where there are street car lines. In the morning peak period, parking would not be permitted on the right side of the street carrying city-bound traffic; and in the evening parking would be prohibited on the right side of streets bearing outbound traffic. The ordinance would apply only to those streets having car lines.

City traffic experts agree with Alderman A. K. Mose, who is sponsoring the measure, that the ordinance would be a great benefit to the many thousands of downtown workers who use the trolleys in traveling to and from their homes. They also point out that neighborhood stores are often closed during the morning rush hours and that they do little business during the homeward rush at night. Alderman Mose believes that the ordinance would not only speed up street traffic but would materially decrease the number of accidents.

## Developments in Cuyahoga Subway Project

The mysterious Cuyahoga Subway Company, which is seeking franchise rights in Cleveland, Ohio, has placed in circulation a new set of petitions for an initiated ordinance, revealing some of the details of the company's plans which heretofore have been carefully guarded. The company is asking a 50-year franchise for the operation of underground, surface or elevated lines on practically every main thoroughfare in the city.

Sponsors of the franchise said that every conceivable route was described in the proposed ordinance, with the idea of allowing the City Council ample room for selection.

No announcement was made as to the amount of money the company is prepared to spend. Banking connections are not known and, with the exception of M. F. Bramley, wealthy paving contractor and amusement park owner, identity of the officers of the company has not been disclosed.

The supposition that the Bramley project is apparently to be hooked up in some way with the Pennsylvania Railroad is backed by the stipulation in the grant that the first route is to be built in Superior Avenue, East Fourteenth Street and a point 1,000 ft. west of the Pennsylvania Railroad bridge, near Superior and East 40th Street. The ordinance also states that the Superior subway is to be the only one having four tracks. All other routes are limited to two. The ordinance provides:

Fare definitely fixed at 10 cents within the city for the first ten years, after which either the city or company could appeal to a board of arbitration or the Ohio Public Utilities Commission.

Free transfers.

Excise tax to be paid annually to the city after 1940, based on ten per cent of the gross passenger revenue less taxes.

Construction to start one year from effective date of the ordinance.

Overhead construction to require the approval of the director of public service. In streets now occupied by Cleveland Railway Company tracks, the approval of the railway also to be required.

Superior route and 4 miles additional of routes to be in operation within three years after construction starts.

Trains to be operated over not less than 5 miles additional of routes in each succeeding four-year period.

Failure to provide service within time limits to give Council the right to revoke franchises on routes not started, "but the company shall have the right to maintain and operate the then existing routes during the life of the grant."

Subway commissioner to be appointed by the city manager.

## Proposed New York Legislation To Affect Transit Board

Bills to reorganize the New York Transit Commission to make it really a division of the Public Service Department will be introduced at the next session of the Legislature under Democratic auspices. The proposed legislation will reserve to the Transit Commission, now legal and then to be actually the metropolitan division of the Public Service Department, only the regulation of capitalization, rates, service, equipment and operation of common carriers within New York City, except baggage and express companies.

It will transfer to the City Board of Transportation, according to the terms now proposed, elimination of grade crossings within New York City, the carrying out of the proposed plan of unification or readjustment of the city's transit lines, which has been prepared by the present Transit Commission and Samuel Untermyer, its special counsel, and the administration of the dual contracts with the Brooklyn-Manhattan Transit Company and the Interborough Rapid Transit Company.

The city administration also will have a transit legislative program, and the bill to create a Transit Authority to carry out the readjustment plan also will be introduced again.

## New Rapid Transit Line in New Jersey Will Need 11-Cent Fare

An average fare of 11 cents will pay operating charges and retire construction costs on the proposed Newark-Paterson-Hackensack rapid transit line, according to an announcement made by the North Jersey Transit Commission Nov. 27, following the compilation of operating costs details by the commission's engineers. The average fare necessary to make the line self-sustaining at the end of the fifth year of operation is estimated at slightly more than 7½ cents. It is estimated that traffic will total 25,000,000 passengers for the first year of operation, which it is said could be 1933, and will have increased to 50,000,000 passengers at the end of the fifth year of operation.

## Ten-Cent Cash Fare in Baltimore

The United Railways & Electric Company, Baltimore, Md., has been granted a fare increase by the Maryland Public Service Commission to 8¼ cents, when tickets or tokens are purchased, with 10 cents for single cash fares. The new rates became effective on Dec. 1 and are an increase from 9 cents cash or three tokens for 25 cents. Officials of the United sought a flat 10-cent fare but this has been denied. Whether the company will again take the case into the courts in an effort to obtain the straight 10-cent fare has not been determined.

This latest action by the Public Service Commission was a result of a ruling by the courts, which remanded the case for further consideration. In fixing the rate of fare the court ruled that the commission should have based its depreciation allowance on present value instead of cost of depreciable property.

## Discussion Goes on in Chicago

**Elevated, surface lines and city's opinions aired on rate of return. Will consider legislation for a fixed return**

ALTHOUGH much progress has been made in recent weeks toward arriving at an agreement on the proposed unification ordinances and new franchises, representatives of the Chicago elevated and surface lines and members of the City Council local transportation sub-committee are still far apart on the question of how much the rate of return to the new company should be. At a joint discussion held on Nov. 26, the companies insisted upon their original proposition of a return of 6½ per cent on the initial capital invested plus one mill per revenue passenger carried, while the committee proposes to allow only a 5½ per cent return plus the compensation feature. A compromise figure of 6 per cent on initial capital value, with all new money to go in at cost (estimated at 5½ per cent) plus the one mill per revenue passenger, was suggested by City Engineer R. F. Kelker, Jr., but it was received by the company representative without comment.

Leonard A. Busby, president of the Chicago City Railway, declared that he could see no reason for modifying the original proposal, considering the fact that the courts and utility commissions have granted to utilities rates of return higher than 7 per cent.

### Rate of Return an Issue

It is the city's contention, however, that the 6½ per cent return asked by the companies plus the compensation feature is about 2 per cent more than they have obtained in the last twenty years. "On the capital account the surface lines have earned an average of about 6.2 per cent for the period, and the elevated lines much less," asserted Mr. Kelker. "As an average they have earned about 5 per cent, while now they ask a total of nearly 7 per cent.

The city engineer questioned the logic of allowing a return of 7 per cent on new capital when the money would cost probably only 5 or 5½ per cent. In addition to agreeing to a return of 5½ per cent on all money now invested, plus one mill per passenger, the city proposes to pay the entire cost of new capital.

Mr. Kelker further pointed out that the companies seek the privilege through the local commission of changing the fares to meet the rate of return. "This means a perpetual franchise under the guise of an intermediate period," he explained. He met the companies' objection to a fixed rate of return by asserting that the 1907 surface lines ordinance provided for a fixed rate, as did also the 1918 and 1925 ordinances.

The companies and the Aldermen were also in disagreement as to whether interest shall be paid upon the city's $53,000,000 traction fund if it is invested in the bands of the new unified company. In support of their contention that such an investment should draw no interest, attorneys for the companies point out that the fund was created by the car riders under the 1907 ordinance and if interest is to be paid the car riders will be paying for the use of their own money. The city, on the other hand, maintains that the interest should be paid, insisting that if it is not the stockholders will be receiving free use of the money. In addition, the city argues, whatever interest is earned will be used for the benefit of the car riders in the construction of subways, extensions or the reduction of fares.

Instead of investing the traction fund in bonds of the new company, P. J. Lucey, attorney for the Chicago Rapid Transit Line, suggested that it be used for the construction of downtown subways, pointing out that unless additional terminal facilities are provided in the Loop district, the entire traction settlement plan will be worthless. Mr. Kelker took the position, however, that it would be futile to build subways until the elevated lines have entered into a contract to use them.

Members of the sub-committee decided to hold a special meeting to determine whether they will try to obtain legislation authorizing a contract ordinance with a fixed rate of return. Attorney Lucey contended that no such contract legally could be made.

## Agitation of Rapid Transit in Detroit

At the spring election the Detroit Rapid Transit Commission will submit to voters a plan for a four-line subway system costing $280,000,000. Mayor John C. Lodge has also declared steps to oust the Detroit Motor Bus Company from streets will be taken after holidays, the city taking over the lines. The Rapid Transit Commission asked to plan downtown subway dips for trolleys, available later, as part of the subway system. This plan would be submitted as alternative to the subway system.

## Payment for Suggestions in Fort Wayne

Suggestions are being sought from all employees of the Indiana Service Corporation, Fort Wayne, Ind., which would improve the workings of any department of the company. They are to be written out, identified by number only and dropped into a suggestion box. Awards will be made to all except heads of departments. The committee, including Robert M. Feustel, president, will judge the submitted suggestions and determine the awards to be made.

## Survey in San Francisco

**City experts to complete by Jan. 1 presentation upon which it plans to base Market Street purchase**

THE recent campaign in San Francisco in which the question of granting an indeterminate permit to the Market Street Railway was an issue was one of the most stoutly contended in San Francisco for a long time. Proponents painted a gloomy picture of chaotic transportation conditions should the measure be defeated. To offset any alarm that may have been caused by the discussion, Samuel Kahn, president of the Market Street Railway, has issued this statement:

We will continue to do our best to serve San Francisco even though we are somewhat handicapped.

Further than that he declined to discuss the company's plans.

In reviewing the defeat of the measure Major Charles H. Kendrick, chairman of the Citizens' Committee against amendment 24, urges the establishment of an understanding between the Market Street Railway and the city government. He is quoted as follows:

Now that the campaign is over, city officials should reach an understanding with the railway looking toward a solution of the transportation problem that faces San Francisco. The Market Street Railway deserves a fair deal from the city and an adjustment of the difficulties between it and the city should be arrived at with the thought uppermost of a square deal for all concerned.

Supervisor Havenner, chairman of the finance committee of the board and one of the leaders in the fight against the measure, said:

There is being made by the force of City Attorney O'Shaughnessy a survey and valuation of such properties of the Market Street Railway as will be of utility to the city in its ownership of the entire street car system within its limits. This survey should be completed by the first of the year.

Meantime the Public Utilities Committee of the board is considering the situation with relation to the action the city shall take when this valuation is before it. Just what plan will be decided upon has not been determined. I have no authority to speak for the committee, but I believe that, as the problem seems to be one of finance, the voters will be asked to approve a bond issue enabling the city to purchase the privately owned street car systems.

Another solution would be to make arrangements to purchases the properties on the pay-as-you-go plan. This, should it prove acceptable to the owners, probably would mean the paying of a higher price than were the purchase outright.

Should no plan be arrived at when the franchises begin to expire, I feel certain that the companies would be willing to continue operation on a sufferance agreement until such time as is necessary. This arrangement also would be in effect, I believe, in case a bond issue were defeated, and the pay-as-you-go plan should not meet approval.

The Supervisors have been accused in the campaign just ended of neglecting their duty in the railway situation. I feel that such accusation was unjustified. The bond issue of first consideration was that providing for the purchase of Spring Valley. At that election it was deemed inadvisable to place another major issue on the ballot, and it was deemed inadvisable to place it on the ballot at the election just ended. This would have been the case had there been a purchase price agreement.

I believe the survey and valuation of the railway properties now under way will establish a reasonable price for the California Street Cable Railway and also for the Market Street line. I see no cause for any alarm in the situation.

# Seattle Moves Toward Settlement

**Every possible economy being put into effect on municipal railway pending the development of a real program. Leasing of the railway for private operation being advocated**

AT LEAST two far-reaching rival programs for the solution of Seattle's involved transportation problem probably will be submitted to a vote of the people next March, unless the combined ingenuity of the City Council, Mayor Frank Edwards and George B. Avery, superintendent of city utilities, with the aid of leading citizens, is able meantime to cope with the situation with facilities already at hand.

One of the proposed plans involves public refinancing with a bond issue for the rehabilitation of the railway and its reorganization and development along modern rapid transit lines.

The other plan advocates the leasing of the railway and the granting of an exclusive long-term taxicab franchise to go with the lease to private operators who will merge the two services into one transportation system. An arrangement of this kind is now being sought by private capital, represented by Karl H. Kaye, whose proposal is being considered by the Mayor and Council.

Under the refinancing and bonding plan, it is stated, a program designed to anticipate Seattle's development for many years would be outlined, with a view to speeding service to and from the downtown district by the aid of elevated tracks, subways and other innovations. It would provide for lighter, more comfortable cars, lower operating and maintenance costs and further economies by cutting out unprofitable car routes and bus lines, city officials declare.

The leasing plan would contemplate the payment of the present railway debt, rebuilding of many of the present car lines, equipment of the system with new cars, and extension and improvement of service for the city as a whole at private expense. Further proposals are expected shortly from Mr. Kaye, applicant for the street railway system lease and taxicab franchise. Mr. Kaye said:

Acceptance of our proposal will mean the rapid rehabilitation of the entire railway system, at private expense, so that it will give the adequate and efficient service demanded of it, and without which the growth and progress of Seattle is being retarded. It will remove, probably for all time, danger of laws being so amended that resort may be made to a general property tax to support the operation of the municipal railway, and it would accomplish this without the sacrifice of the municipal ownership principle, for the city would still own and control the system under our plan.

We have asked for a taxicab franchise along with the railway lease, because the railway cannot be made profitable without control of the taxicab competition and because taxicab service profits are needed to compensate for losses on parts of the present system, and on new extensions that may be necessary in different sections of the city.

In the meantime G. B. Avery has been proceeding with the overhaul of the municipal railway. This involves sharp reductions in personnel and extensive rerouting of car lines designed to effect an annual saving of $350,000 in operating costs. Initial steps taken involved the release of three veteran subordinate officials: Edward E. Mitchell, supervisor of traffic; S. E. Goodwin, supervisor of power; and Robert Nesbitt, assistant supervisor of power. Other dismissals, including at least seven of the fourteen railway inspectors, are expected to follow. Before starting his reorganization program, Mr. Avery took the precaution to assure himself of Mayor Edwards' backing and of a policy of non-interference on the part of the City Council utilities committee.

Establishment of a new uptown street car loop around one block, perhaps two blocks, near the center of the retail district, with transfer points at all corners; curtailment of left-hand street car turns, and use of more one-man cars are other probable developments of the near future. Adoption of these features would effect greater economy and speedier service in the railway department and bring about relief for the growing congestion of traffic in general through the downtown business district, it is declared. Parking of automobiles probably would be forbidden in the blocks forming the new loop, but through automobile traffic would be speeded on all four streets, with street car patrons protected by a well-guarded safety zone extending completely around the loop.

Another feature being considered is the resumption of the skip-stop system abandoned during the administration of former Mayor Bertha K. Landes. More split routes and shorter runs are also favored. A return to the skip-stop system would reduce by nearly one-half the street car stops in the more thickly settled residence districts, it is declared, allowing traffic to move along with correspondingly less interruption, and would be a move toward relieving motor traffic, which is becoming increasingly

congested and exceedingly complicated.

In the meantime, Seattle taxicab men have been granted a respite in a projected campaign by the city utilities department to compel the use of taximeters on all taxicabs, in place of zone systems and special rate plans under which many of them are operating. This announcement is in harmony with the decision of the City Council franchise committee to hold in abeyance rival negotiations of Sam V. Taggart for an exclusive taxicab service franchise, for the same reason.

While the various problems are being considered, the residents of Beacon Hill must also wait for their proposed extension from the present terminus at Spokane Street and Beacon Avenue to Beacon Avenue and Columbian Way, although the petitioners have presented to the utilities committee a written guarantee to make up to the city any discount which might be exacted on street railway bonds necessary to finance such an extension.

## Claims Executive Committee Meets

For the purpose of discussing arrangements for the 1929 convention the Claims executive committee met at association headquarters on Nov. 21, with President L. F. Wynne in the chair. Decision was made to designate the special committee which had been appointed to study Mr. Kubu's suggestion as the "committee on uniform negligence law." It was tentatively agreed that the Claims Association meet at 2 o'clock on Monday afternoon of convention week; that an informal luncheon be held either Tuesday or Wednesday, depending upon which day was reserved to inspection of exhibits, and that final session be held at 2 p.m. Thursday.

The sub-committee on subjects reported no progress, but was instructed to include among its scheduled papers one on the advantage of attendance of claims adjusters at the convention on account of the value of personal contacts made there. A sub-committee reported that copy for the Proceedings had been edited and passed for publication. The committee will meet again Jan. 24-25 at Indianapolis, upon the occasion of the mid-winter meeting of the C.E.R.A. Those present were L. F. Wynne, president; C. A. Redfern, J. W. Giltner, Seth Baldwin, W. E. Robinson, Trevor Nielson, W. F. Weh, W. A. Foley and Wallace Muir.

## New Franchise Ordinance in Bluefield Proposed

A proposed ordinance which would give to the Tri-City Traction Company a new franchise and declare null and void three other grants now held by the company in Bluefield, W. Va., has been submitted to the board of directors. It was explained that one of the three franchises held by the company expires in 1933. The purpose is to enact a blanket franchise covering all the lines that will materially benefit the company.

## Safe Operation Rewarded in Illinois

Fifteen motormen and bus operators of the Champaign-Urbana railway and bus line division of the Illinois Power & Light Corporation recently received bonuses of $5 each for completing 270 hours operation without accident of any nature.

## The Copper Country Sticks to Its Street Cars

In the copper country of Michigan, where the snow piles high in the winter, making walking anything but a pleasure, citizens are not inclined to think lightly of the service provided by street cars, says the Duluth (Minn.) *Herald*, in commenting on the fact that every city in the district has voted to renew a franchise to the Houghton County Traction Company permitting it to operate on a 30-year writ. Here is the account from the *Herald:*

An attempt has been made for the last three years to keep state highways open to wheeled traffic in the winter season and remarkable success has been attained. There are times, however, when all the snow-fighting equipment in the Upper Peninsula would be unable to keep the highways between Copper country towns open.

When a 40-mile wind sweeps out of the Northwest, carrying snow so thick it blocks visibility like a heavy fog, the snow piles up faster than it can be moved aside. Five minutes after a tractor plow snorts its way through drifts to open a lane the road is blocked again. In cases of this kind Copper country people have one way of getting around their country and that is by street car. Street cars in the Copper country run constantly and are ready for all kinds of weather.

In the depression which swept this district a few years ago when thousands moved to other industrial centers of the Middle West the business slumped and the Houghton County Traction Company went into the hands of a receiver. Conditions are on the uptrend again and business is picking up with the carrier. The enthusiastic approval given at the polls recently instills new ambition and confidence in the firm.

## Fact-Finding Committee for Omaha Bridge Proposal

Mayor Dahlman of Omaha and Mayor Greene of Council Bluffs have named committees of business men to meet with President Shannahan, of the Omaha & Council Bluffs Street Railway, for the purpose of determining what is a fair price for the bridge across the Missouri River. The bondholders have told Mr. Shannahan that they are prepared to sacrifice private ownership of the bridge for the public good, but that in return they expect a fair price.

The joint committee is first instructed to inquire as to the price and conditions upon which the present bridge can be purchased, as well as the terms by which the railway lease upon it can be bought; to collect information as to the cost and present purchase value of the bridge, together with information as to cost of maintenance and operation. It is also to find out what revenues may properly be expected after purchase, and from what source. It is also to determine the kind and cost of a bridge between the two communities, if it develops that a new one must be erected to serve as a free bridge.

The Omaha newspapers are backing the proposal for purchase of the old bridge, and say the people are willing to pay a sum slightly more than a new bridge would cost, but that the people are not buying an investment, hence the present owners should not take any possible profits into consideration. Mr. Shannahan is said not to anticipate any particular trouble in getting an agreement as to that price when all the facts are made known.

## Christmas for Atlanta's Children

Youngsters of the Georgia Power Company, Atlanta, Ga., will receive a Christmas present through *Snap Shots*, the official paper of the company, if they are under twelve years old and write a letter telling Santa what their happiest Christmas was. Pictures of the letter writers are being solicited by *Snap Shots* for early publication.

## Placing the Burden Where It Belongs

Richard Palmer, a student in the law school of Denver University, has been awarded first prize in a national contest conducted by the Phi Delta Phi legal fraternity, for his essay, "Stop, Look, Listen." Among the salient points of that essay are:

There was a time when liability for grade crossing accidents rested almost entirely on the railroads, and the courts imposed heavy damages on them when a train struck a carriage or one of the early one-lunged "gas buggies." With the development of the automobile it became apparent that arbitrarily to blame the railroad was not just. Gradually the judicial view of such accidents has changed and the trend of recent decisions is to hold the motorist accountable for his own mishap.

In developing this view, the courts have taken account of the difficulty of stopping trains quickly and of the fact that motorists now approach grade crossing with full knowledge that they should "Stop, Look, Listen."

## Half Fare Plan for Worcester Children Abandoned

Although officials of the Worcester Consolidated Street Railway, Worcester, Mass., at one time considered adopting a half-fare strip ticket for children during the vacation months similar to that tried in Springfield, Mass., the past summer, it was decided that the children's transportation problem at Worcester in the summer was not comparable to that in the sister city. Between 70,000 and 80,000 tickets were sold to children during the summer in Springfield, but officials there are not yet certain if the plan has been a financial success.

# Recent Bus Developments

## De Luxe Service Proposed in Jacksonville

Permission is to be sought by the Jacksonville Traction Company, Jacksonville, Fla., to operate a de luxe express bus service from Murray Hill and Avondale, into the downtown district. A petition detailing how the company will operate the buses is now being prepared and will be sent to the Council.

Four new buses, the very latest in the city type, will be purchased immediately after Council authorizes the operation of such service.

As indicated in a recent issue of ELECTRIC RAILWAY JOURNAL, negotiations between the city and the company looking toward a new franchise are expected to be resumed shortly.

The bus fare will be 10 cents cash. Transfers will be issued to the car lines, and passengers paying the 10-cent cash street car fare will be transferred to the bus line. Murray Hill passengers who desire to use the reduced rate of 7 cents or the weekly pass will be transferred to and from the Murray Hill car line at the Murray Hill terminal. The buses now used as a feeder to the present end of the Murray Hill car line will be withdrawn.

The buses will operate express between Park and King Streets and the downtown section, with stops only at Five Points, the union depot and Broad and Adams Streets. The downtown terminus would be at Forsyth and Laura Streets. The buses would run "local" beyond King and Park Streets.

The buses will operate every twenty minutes, from 6 a.m., until 10 a.m., and from 4 p.m., until 9 p.m., and every 30 minutes from 10 a.m., until 4 p.m., and from 9 p.m., until 1 a.m., except on Saturday and Sunday. A regular twenty-minute schedule will be maintained all day on Saturday, from 6 a.m., until 1 a.m. A 30-minute schedule will be maintained on Sunday, from 7 a.m., until 8 p.m., and an hourly schedule, from 8 p.m., until 1 a.m.

## Canton-Youngstown Rights Sought

Petitions and protests are keeping the Ohio Public Utilities Commission busy these days since the Youngstown & Suburban Transportation Company abandoned part of its bus route between Canton and Youngstown on Nov. 1.

It was with permission of the state board that the Youngstown & Suburban withdrew its buses between Canton and Salem, a run of 33 miles, and joined the Stark Electric Railroad in furnishing double service over this line. At Salem, cars which leave Canton on the hour connect with Youngstown & Suburban buses for Youngstown. Formerly, there was only two-hour service between Salem and Canton.

Hardly had the buses stopped running before the Warren-Salem Coach Line and the Salem-Akron Transit Company applied to operate over part of the abandoned line. These petitions were followed by the Michele Transportation Company asking a permit to operate between Youngstown and Canton.

Both the Stark Electric and the Youngstown & Suburban lines are protesting the issuance of new certificates. No definite action has yet been taken by the state board on any of the petitions or protests.

## Taxes and Insurance Matters of Moment in Iowa

Attorneys for Iowa bus lines, which have been waging a long legal battle against the ton-mile tax recently upheld by the Iowa Supreme Court have filed a petition for a rehearing, which is scheduled for Dec. 12. The high court ruled on Sept. 28 that Judge W. G. Bonner, of the Polk County District Court, was right in his decision that the law does not discriminate against the motor carriers with fixed terminals and routes.

The petition attacks the constitutionality of the law. It raises the question of whether the measure does not discriminate between motor carriers by turning over the highways to one class of users for profit, with immunity from taxation, while denying the same immunity to others using similar types of vehicles. It is contended by the petitioners that, unless the court can find an actual distinction in the "wear and tear" on the Iowa highways, the motor carriers operating between fixed terminals should not be charged a ton-mile tax, while other motor carriers, operating for profit without definite routings, are allowed to use the roads free of tax.

Indications are that the Legislature will take up the whole question again at the coming session in an attempt to levy a general tax on all privately owned buses and trucks operating over the highways for profit. The amount of back taxes involved in the court proceeding is $66,000. Approximately $52,000 of this sum is assessed against Mrs. Helen Schultz Brewer, head of the Red Ball Transportation Company of Mason City, long known as the "Iowa Bus Queen."

Another matter, which is likely to go before the Iowa legislature at Des Moines this winter, is a request to change the motor vehicle law, so as to define more clearly the liability of insurance companies writing liability insurance bonds on the motor carriers which come under the provisions of the law. This question was brought to the attention of motor vehicle owners and insurance men of Iowa recently, when the Black Hawk County District Court interpreted the motor vehicle law as assuming unlimited liability on the part of insurance companies, in cases where riders on passenger buses are injured.

This interpretation, it was pointed out, would make the insurance companies writing the bonds, responsible for any amount of damages which a jury might see fit to award in a personal damage case against a bus transportation concern. For a time, the companies holding the major portion of the bonds on Iowa's motor carrier companies threatened cancellation of the policies. W. A. Lawrenson, state agent for the Underwriters Service Company, declared no company could afford to take the added risk at the amount of the present premium. However, after consideration, it was decided to leave the situation in *status quo* and await possible action by the Legislature or the appeal of a case to the Iowa Supreme Court. The insurance companies can still cancel upon ten days' notice, it was said.

Failure of the Iowa bus companies to get bonds would automatically put a stop to motor vehicle transportation of passengers, as filing of a bond is a prerequisite to operation in this state.

## Proposal of Knoxville Company Still Pending

The City Council of Knoxville, Tenn., will oppose before the Railroad & Public Utilities Commission any petition filed by Knoxville Power & Light Company to increase its token fare charge from 6 to 7 cents.

Agreement to this effect was reached in an adjourned session of the Council held to consider the most recent proposal of the company relative to instituting bus service in areas not now served by railway lines and the relinquishing of its private right-of-way in Kingston Pike west of the Louisville & Nashville Railroad overpass.

To represent the Council in any proceedings the Power & Light Company may bring for the purpose of increasing its present token fare. Mayor James A. Fowler has appointed Messrs. Wright, Monday and Fretz.

## Schenectady to Scotia by Bus

Abandonment of the electric railway to Scotia, N. Y., from Schenectady is expected to bring about a bus service to the village, application for which has already been filed with the Scotia Village Board by the Schenectady Railway Bus Lines, Inc., a subsidiary company of the Schenectady Railway. A similar application has been filed with the Schenectady Common Council, asking the city's permission to operate the bus service to Scotia from the railway's waiting room on State Street and from the General Electric Company terminal.

# Bus Service to Replace Detroit's Jitney's

**General Manager Del A. Smith has proposed a system that makes faster time, he claims, and will be cleaner, more comfortable and more dependable than the old jitneys**

NINE routes have been designated by the Detroit Department of Street Railways to be traversed by the new de luxe motor coaches which the department has ordered to replace the jitneys, ruled off the streets under the recent decision of the Michigan Supreme Court. It is the intention of the Department of Street Railways to have 160 sixteen-passenger de luxe buses in operation by Dec. 15.

Four of the lines planned will replace the former jitney lines while others will run into new territory not previously served by jitneys. The lines first mentioned will be operated on or parallel to Woodward, Grand River, Jefferson Avenues and Fort Street. Two of these lines the general manager expects will be in complete operation by Dec. 1.

Eighteen of the new coaches have arrived and were placed in operation on Woodward Avenue line on Nov. 25. The fare announced is comparable to that of the former jitneys: 10 cents from downtown to Webb Avenue; 15 cents from downtown to Highland Park; and 20 cents from downtown to the Six Mile Road.

The Woodward Avenue line will extend from Palmer Woods, its outer terminus, to downtown, operating part of the way over Cass and Second Avenues. The Jefferson Avenue and Fort Street lines will operate over those thoroughfares. The outer extremity of the Jefferson line will be at Wayburn Avenue and of the Fort Street line at Woodmere Cemetery.

The Grand River Avenue line will run for a part of the distance over Ash Street, West Grand Boulevard, Milford, Beechwood and Woodside Avenues, hitting Grand River Avenue at a point south of Livernois Avenue. This will increase the distance by ¾ mile, but it is believed that better time will be possible because of the lighter traffic to be encountered.

The other routes planned have not been served by jitneys. They will include the following lines: out Grand River Avenue to Linwood Avenue, following Linwood Avenue to the Six Mile Road; out Brush Street and Oakland Avenue to the Eight Mile Rd.; from Gratiot Avenue and the Seven Mile Road to Gratiot and East Grand Boulevard, thence downtown via the Boulevard, Verner Highway, McDougall Avenue and Macomb Street; out Lafayette Avenue east, Van Dyke Avenue and Warren Avenue; out Congress Street, Mt. Elliott and Mack Avenues.

The line to operate from the downtown section out Porter Street and across the new Ambassador bridge to Windsor, Ontario, will not be started immediately over any part of the route but will depend upon the date of completion of the new international bridge.

While the Department of Street Railways is proceeding with the purchase of new buses and street cars to care for all the traffic handled by the jitneys, some of the downtown merchants advocate that the jitneys be permitted to return to the streets to operate on a day-to-day agreement. Edward N. Barnard, attorney for the jitney organizations, has submitted to the City Council the following propositions:

1. That the jitneys operate as they did in the past under a day-to-day agreement, the city having power to put them off at any time.

2. That the city rent the jitneys for 12 cents a mile, providing the city agrees to pay for a minimum of 100 miles a day of operation.

3. That the jitneys operate under any other plan the city proposes.

The Council is to hold a hearing within the next few days to consider Mr. Barnard's proposal.

## An Observer's Idea of the Situation

The personal opinion of an observer in Detroit is that the way the city put the jitneys out of business as soon as it had authority is the best and most creditable thing it has done for a long time. Of course, there have been many protests, but a good many of them appear to have been inspired by the former jitney operators. Perhaps the railway department was not as well prepared as it should have been to handle the increased load from the jitney riders, but had there been any temporizing, the jitney men might have, by some hook or crook, sought to continue to operate indefinitely. The best thing was to get rid of them as soon as possible. That is what happened.

So far as the newspapers are concerned there is nothing consistent about their policy and they appear to go from one side of the fence to the other very easily and frequently. Aside from the competitive situation among them, they appear to adhere to the policy of criticizing anything done by the city department when there is half a chance. There now appear to be two other important reasons, other than the withdrawal of the jitneys, for the concern of the downtown stores about the ability of people to do their Christmas shopping. It is intended that stores recently erected by the great mail order houses in outlying sections shall carry the complete catalog items as sold by mail. The policy is to place them at the halfway point, that is far enough downtown so that there will be a considerable urban population beyond the stores. Still the stores are far enough out so that they can have space to park 800 cars at the back of the store building. As a matter of fact, the downtown merchants admit their selfish interest in seeking to make it easy for people to get downtown. They have no figures, no definite information, only a general idea that the demand has greatly increased. If there is any possible way in which the merchants can secure more transportation downtown, they want it, regardless of the difficulty of handling the peak due to a combination of shoppers and workers, regardless of any effect that the added service will have on the financial conditions of the street railway department, and almost regardless of who furnishes the service, except that no one seems to want the Barnard crowd after its six years of fighting the city.

To the mind of the observers on the ground it is not so much the trolley as the Detroit City Administration that deserves criticism. The city has grown so tremendously in recent years that a subway system is sadly needed to handle the heavy transportation downtown. This is out of the question for several years to come, and longer unless the city administration bestirs itself, so the job must be done by cars and buses. In this connection a representative of the Retail Merchants' Association appears to have got at the heart of the difficulty when he said that the nine members of the City Council had been in politics for a number of years and think they are experts on any problem that may come up before them. Instead of taking the advice of experts, the members of the Council are accustomed to use their own small knowledge. Hence, when Dell Smith, manager of the Municipal Railway System, wanted to order several hundred more buses two or three months ago, and put on a de luxe service that would really compete with the jitneys, his suggestions were frowned upon and nothing was done until the jitneys were actually removed. Still the size of the jitney traffic appears to have been over-rated. If the jitneys averaged 80,000 a day, during September and October, they were doing pretty well. But Detroit is booming, the Employers' Association reporting 285,000 men at work on Nov. 1, compared with 200,000 at the similar period last year. The figures cover only the members of the association, but it is said that, by adding 50 per cent, a good picture is presented of the total employment in Detroit.

At first no one could believe that the

jitneys would stop operation. For six years they had weathered every legal storm, with the city always winning in court and always being prevented by appeal or other legal maneuvers from capitalizing on its victory. The jitney men had submitted their case to the voters at a city election in the fall of 1926, but their proposal to repeal the regulatory ordinance was defeated by a considerable majority.

Rumors of last-minute jitney coups were abroad. The cars were to be used as taxicabs, or no fares were to be collected, the patrons being permitted to make voluntary contributions. But the city went ahead promptly and decisively. On Friday, Oct. 26, the Supreme Court decision had been recorded and was presented to the Circuit Court, which thereupon dismissed its injunction.

A few of the jitney men threatened to continue running even after the injunction was lifted, but most of them took the order seriously, in fact, very seriously, the announcement of the city authorities that no more tickets would be handed out, but that jitneys violating the ordinance would be seized and towed to the city pound. This action was actually taken by the police authorities in the case of three jitneys operating to one of the suburbs. Their owners defied the ordinance in the belief that it did not cover the suburban operators. The service to the suburbs involves a distinct problem, which is considered later in this article.

At the time the Supreme Court decision was put into effect, about 1,000 jitneys were being operated on the city streets. Only about 500 of these were involved in the six-year legal proceedings. The others were newcomers, usually referred to as "wild cats," that began to appear during June and July of the present year. The general scheme was to follow a route that led into some important downtown point where regular loading points with starters were established. Starters were also maintained at the outlying terminals to control the drivers, establish spacings, and exercise general supervision. Parking space was available at the outlying terminals, but downtown the jitneys would often be making a circuit on nearby streets and waiting their turn to get into the stand and pick up passengers.

Just what caused the influx last summer is difficult to explain. A number of reasons have been advanced by those familiar with the situation. It was known even in the spring that the Supreme Court would hand down its decision in October. Most people believed that it would be in favor of the city. Perhaps this suggested the idea of making hay while the sun was shining. Another factor, possibly, was the increased activity in the automobile factories. These were employing about 40 per cent more than last year, thus greatly increasing the load on all the transportation facilities and suggesting a field for other services, no matter how small or humble.

Now that the forces of law and order reign triumphant, what is going to happen? The way is clear, it appears, for the city to administer the ordinance. While excluding jitneys from certain main thoroughfares, parks and boulevards, this gives the Mayor authority to issue or revoke jitney licenses on the other streets of the city. The Supreme Court decision said that the Mayor had the right to grant or withhold licenses for proper cause. This cause is not defined in the ordinance, which merely makes it discretionary on the part of the Mayor to issue or revoke the licenses. Obviously, he has complete control of the situation. In exercising this control the corporation counsel, the police department and the Department of Street Railways have already been called upon for their advice and consent.

Because they had taken steps to obey the ordinance, thirty jitneys were granted permits early in October. These are still running on Hamilton Avenue, from Library Square downtown to the southern limits of Highland Park. The route parallels to a large extent one of the D.S.R. trolley lines. Under the ordinance not more than one passenger can use the seat beside the driver. Stops to load or unload must be made at the far side of street intersections, and within two feet of the right hand curb. The jitneys are forbidden to cut ahead of "any other driver, motor bus or any vehicle for hire, in order to pick up a passenger when both vehicles are within 100 feet of that passenger."

Once the jitneys were removed, additional service was put on by the Department of Street Railways. It rented 40 trolleys from the Eastern Michigan Trolley System (formerly of the Detroit United Railways) and 24 from the Cleveland Railway. New trolleys are being purchased, but the trouble is that the tracks in the downtown district have almost reached their capacity during rush hours. More transportation is clearly required, with fair consideration given the many riders who honestly believed the jitneys provided the fastest, cheapest and, in many respects, the most comfortable transportation in the city of Detroit.

In enforcing the jitney ordinance the police made no distinction between the city and suburban variety. Before the fateful Oct. 26, 100 or more jitneys were thriving on the cream of shopper and commuter traffic. Like the city jitneys they were depending on parallel bus and car lines to furnish the regular service and to carry the greater part of the traffic.

# Financial *and* Corporate

## Review of Von Herberg Suit Denied

The United States Supreme Court has denied the Puget Sound Power & Light Company review of a suit against J. G. Von Herberg and the city of Seattle, in which the Circuit Court of Appeals ruled against the company on a jurisdictional point. Mr. Von Herberg, owner of $100,000 in city warrants, sold to pay for operation of the municipal street cars, claimed priority in the gross revenues of the street car system, and the Puget Sound company brought suit to insure its claims for payment from the revenues. In effect, the decision upholds that of the Circuit Court of Appeals at San Francisco, which on Sept. 19 held that the matter was not a proper one for the federal court, but must be tried in state court.

This decision means that Mr. Von Herberg is now free to press his litigation in the Superior Court, and his attorney, Robert P. Oldham, announces that the suit will be pressed to trial at the earliest possible date.

## Would Suspend Service in Santa Barbara

The Santa Barbara & Suburban Railway has applied to the Railroad Commission for authority to discontinue operation of its street railway service in the city of Santa Barbara, Cal. The company sets forth in its application that despite the action of the Railroad Commission last January in granting it an increase in fares to 10 cents, with a weekly ticket selling at 25 cents that entitled the holder to ride for an additional 5 cents, the revenues of the lines have been insufficient to warrant their continuance. Two lines in the city of Santa Barbara cover a total mileage of 11.5 miles.

## Improvements in Toledo Affairs

Following a gain of $30,000 in revenue in September the Community Traction Company, Toledo, Ohio, increased this to $45,000 gain in October compared with the previous year and kept its record of turning in a surplus from operations every month this year so far. These facts are disclosed in the report submitted by Commissioner E. L. Graumlich to the street railway board of control at its meeting on Nov. 14. October revenue was $324,341 compared with $277,923 for a similar month in 1927. There were 4,173,447 revenue-passengers carried. Operating expenses were $219,680 including $42,796 for maintenance. Taxes were $17,205 and after depreciation, interest, and adjustments for power refund there was a net surplus of $25,249 for the stabilizing fund, bringing the deficit to $1,151,624 and the fund reserve for purpose of fare regulation to $60,625. No downward revision of fare will be possible until this fund reaches a $500,000 level. This is possible in about eighteen months under the present rate of progress.

Railway operation produced $265,615 in revenue while the coach operations brought in $57,249. Coach operations now show a slight profit.

The ten months of 1928 show a gain of more than 2,000,000 car riders over a similar period in 1927.

Elimination of independent bus competition, better employment conditions, more economical operation, and relief from sinking fund charges all contributed to the better showing.

## New Third Avenue Director

At the annual meeting of the Third Avenue Railway, New York, N. Y., Nathan L. Ottinger was elected a director to take the place of Alexander S. Webb, resigned.

## Puget Sound Passes to Engineers Public Service

Charles W. Kellogg, president of the Engineers Public Service Company, states sufficient common stock of Puget Sound Power & Light Company has been deposited or pledged and sufficient preferred stock and proxies are on file with Puget Sound company to effect consummation of plans for acquisition of control of the Puget Sound company by the Engineers Public Service. The deposit period expired on Nov. 16.

## Loss by Schenectady Railway on Quarter's Operation

The Schenectady Railway, Schenectady, N. Y., reports to the New York State Public Service Commission for the quarter ended Sept. 30, 1928, net loss of $61,401 after charges, compared with net loss of $36,688 in the corresponding quarter of 1927.

## Fewer Passengers in Kansas City

The Kansas City Public Service Company, Kansas City, Mo., reports a loss of 84,694 car fares and 20,643 bus fares for the week ended Nov. 4, compared to the corresponding period last year. The total loss in revenue was $8,027, a decrease of 4.65 per cent. The total decrease reported since Jan. 1 now totals 3.94 per cent for a total of $300,632. Since Jan. 1, 1928, 3,302,067 fewer persons have ridden the street cars and buses than during the first ten months of 1927.

## Net Income Lower on Brooklyn City

For the four months' period ended Oct. 31, 1928, passenger revenue of the Brooklyn City Railroad, Brooklyn, N. Y., was $3,676,522, as against $3,694,735 for a similar period ended Oct. 31, 1927. Operating expenses and taxes advanced from $3,249,352 to $3,296,095 for this year. After income deductions the net corporate income for the four months' period of this year was $309,684, compared to $351,593 for the four months ended Oct. 31, 1927.

# Legal Notes

CALIFORNIA—*Injury to Alighting Passenger by Sudden Start of the Car.*

The act of a conductor, although done while in service, cannot bind the street railway if it does not fall within the scope of his duties. A street car was stopped in front of an approaching railroad train because of a motor truck stalled in front of it. The conductor called "everybody off." At the same time the motorman started the car, and a passenger attempting to alight was injured. It was held that the conductor acted within the scope of his employment, and there was concurrent negligence on the part of the conductor and motorman, which was the approximate cause of the passenger's injury. [Little vs. Los Angeles Ry. Corp., 121 P., 134.]

ILLINOIS—*Right of Elevated Railway to Allow Use of its Tracks to Another Company.*

By virtue of their charter and the assent of the city and abutting property owners, the elevated railroads in Chicago became vested with property rights in their right-of-way as completely as though the grant had been made directly by the state. Consent of the city and abutting owners is not necessary to the validity of an operating agreement by which the company permitted another railroad to use its tracks for passengers and freight traffic, in view of the provisions of the Public Utility Act. Such use did not constitute an additional burden on the streets where no additional obstructions were placed in or over them, and no limitation existed on the number of cars to be run on the track. [Chicago N. S. & M. R. Co. vs. City of Chicago, 163 N.E., 141.]

IOWA—*Motor Vehicle Tax Upheld.*

The 1927 Legislature passed a motor vehicle tax by which commercial vehicles, whether freight or passenger, were taxed one-fourth of 1 cent per ton mile if equipped with pneumatic tires, and one-half of 1 cent per ton mile if equipped with solid tires. The law explained the method of determining the tonnage. The tax was attacked as unreasonable and discriminatory, but was upheld by the Supreme Court of Iowa. [Iowa Motor Vehicle Association vs. Board of R.R. Com., 221 N.W., 365.]

MISSOURI—*Duty of Automobile Passenger To Warn Driver.*

An automobile passenger's negligence in permitting the driver to cross the track ahead of an approaching street car without protest is proper for submission to the jury, though the instructions of the trial court that such a passenger could not recover from the railway if the collision was caused solely by the driver's negligence was held to be erroneous. [Shumate vs. Wells, 9 S.W. (2d), 632.]

MISSOURI—*Skidding of Bus Is Prima Facie Evidence of Negligence.*

When a bus skidded and hit the curb and a passenger was thrown out of her seat and injured, a *prima facie* case of presumptive negligence arose under the *res ipsa loquitur* rule and was aided by the defendent's evidence, so that the case was properly submitted to the jury. It would be most unfortunate, in view of the extent of modern motor bus transportation, if a motor bus carrier, in the event of injury to a passenger by the overturning or wrecking of a bus, or by collision, deprived the passenger of the benefit of this rule by showing that the accident was occasioned through the skidding of the motor bus and thereby escaped liability for injury. [Heidt vs. Peoples M. Co. of St. Louis, 9 S.W. (2d), 650.]

MICHIGAN—*Pedestrian Should Know That Rear of Street Car Will Overhang When Car Rounds a Curve.*

Pedestrians are presumed to know that a street car will overhang at its rear end when rounding a curve. Hence, the motorman of a car is not bound to keep watch of the overhang, but may discharge his duty by looking ahead. [Hering vs. City of Detroit, 221 N.W., 278.]

OHIO—*Collision With Automobile Without Tail Light.*

Although an automobile driver was negligent in leaving his automobile on a highway without a tail light, he can recover damages to his car when struck by a street car, unless his negligence was the approximate cause of the injury. [Columbus R. P. & L. Co. vs. Pickles, 162 N.E., 614.]

SOUTH DAKOTA—*Mandamus Legal Remedy to Compel Companies to Pave.*

A company's franchise required it to do certain paving, and the city received judgment for a writ of mandamus. This was held proper, though if the defendant was entirely unable to defray the cost of the paving, a procedure in the nature of a *quo warranto* might be the proper remedy. The plea of the company that the city should pave, then bring suit to recover cost was rejected. [City of Sioux Falls vs. S. F. Traction Co., 221 N.W., 84.]

VIRGINIA.—*Right to eject an invalid transfer upheld.*

A passenger received from the conductor of the car on which he paid his fare a transfer punched for 5:45 p.m. instead of 3:25 p.m. When he attempted to use the transfer on another car, it was rejected because it was improperly punched, and he was ejected. His suit for damages for ejectment was not allowed. [Virginia E. & P. Co. vs. Brown, 144 S.E., 708.]

# Personal Items

## E. J. Pearson Resigns from New Haven

Edward J. Pearson has resigned as president of the New York, New Haven & Hartford Railroad. Ill health is given as the cause of the resignation, which will be effective on Dec. 31.

Mr. Pearson became head of the system on April 24, 1917, succeeding Howard Elliott. He had been with the New Haven only about a year when he became its president.

He was born in Rockville, Ill., in 1863, of New England ancestors. After his graduation from Cornell University, Mr. Pearson served with several Western railroads. While in the West he developed the first "hump" freight yard on the Pacific coast. Later, when he came to the New Haven, one of his achievements was the building of the large railroad classification yards at Cedar Hill, Conn.

Mr. Pearson came to the New Haven as vice-president, having been called from the Texas & Pacific, of which he was vice-president. A year later he became president. During the war he was federal manager of the road when the system was taken over by the government. Since 1920 the road has shown a steady increase in net earnings and dividends were resumed on the common stock, the first payment of the kind made since 1913.

During his career in the West, Mr. Pearson was connected with the St. Paul, the Missouri Pacific and the Texas & Pacific railroads. He constructed terminals in St. Louis, Kansas City, New Orleans and Chicago.

With regard to the probable successor of Mr. Pearson, Edward G. Buckland, vice-president of the road, has been mentioned as the most likely candidate.

## E. M. Bassett to Plan New York City's Zoning

Edward M. Bassett has been appointed to the city planning post by Mayor Walker of New York City. The new appointee has a long record of public service activities. In 1922 he was appointed by Secretary Hoover as a member of the advisory committee on zoning. His term of office as a member of the Public Service Commission of the first district of New York expired in February, 1911. His greatest service to the commission, the ELECTRIC RAILWAY JOURNAL said some time ago, was in connection with framing the new rapid transit law and in pushing the elimination of dangerous grade crossings. Since 1902 Mr. Bassett has been connected with the law firm of Bassett, Thompson & Gilpatrick.

In announcing the acquisition of the services of this zoning expert, Mayor Walker said it was a step toward the foundation of a permanent planning commission for the city. He added that the new commission when organized would study the present situation regarding zoning of all boroughs, and attempt to work out a plan for the future development of the city.

## F. J. Gannon Assumes New Duties in El Paso

F. J. Gannon has assumed his duties as manager of the El Paso Electric Company, El Paso, Tex. He succeeds Joseph Bowes, who, as noted previously in ELECTRIC RAILWAY JOURNAL, goes to the Virginia Electric & Power Company.

Mr. Gannon was formerly at Davis Island, at Tampa, Fla., where he held the position of vice-president of Davis Islands, Inc., a firm organized for the development of the islands of Tampa Bay. He has been in the public utility field for the past 26 years and has an exceptional record to his credit.

After completing school in 1902, he started out in the general offices of Stone & Webster, Inc., and since that time has been continually with companies under that firm's management.

After four years of training he was sent to Dallas where he became connected with the Light, Power & Railway Company, later being connected with the Pawtucket Electric Company, Pawtucket, R. I. His first step to an executive position occurred in 1910 when he was sent to Brockton, Mass., as assistant treasurer of the Edison Electric Illuminating Company, and a year later to Reno, Nev., as assistant treasurer of the Reno Power, Light & Water Company and Truckee River Power Company, serving gas, electric light, power and water.

By this time Mr. Gannon had so well established himself in the utility field and demonstrated such rare executive ability that in 1916 he was selected to fill the position of assistant treasurer with the Northern Texas Traction Company at Fort Worth. While he was in Fort Worth, so marked was his broad experience and unusual ability as an executive that when Stone & Webster took over the development of the Davis Island project Mr. Gannon was selected to serve as assistant treasurer, since a man of unusual financial and executive experience was needed. He served only one year in that capacity, and was then made vice-president of the undertaking.

When Mr. Gannon went to Davis Island the construction program was in its infancy and he served in his usual efficient manner. Davis Island is now considered one of the most beautiful residential sections of Tampa and Mr. Gannon deserves great credit for the part that he played in its development.

## Burt Hamerstrom Promoted in San Francisco

Burt Hamerstrom, in charge of the commercial department of the Market Street Railway, San Francisco, Cal., has also been made head of the transportation department. Accordingly, his title has been changed from vice-president in charge of commercial department to vice-president in charge of service. When the commercial department was established by the Market Street Railway two years ago, Mr. Hamerstrom was chosen to be the one to work directly under Samuel Kahn, executive vice-president.

As a former newspaper man, well versed in the business of customer-ownership and public relations, the choice of Mr. Hamerstrom to establish close relations with the public was considered a fortunate one. Mr. Hamerstrom spent about ten years as a reporter and feature writer in San Francisco, Chicago and Seattle. For more than ten years he was associated with public utilities, including the United Gas Improvement Company, American Light & Power Company and the Illinois Power & Light Corporation.

## J. P. Daratt to Go to Havana

Joseph P. Daratt, for more than four years manager of the Frankford, Ind., plant of the Northern Indiana Public Service Company, has accepted a position with the Compania Cubana De Electricidad of Havana, a subsidiary of the Electric Bond & Share company of New York City. The corporation operates the power, electric railway and gas utilities of Havana.

Mr. Daratt will sever his connections with the Frankford branch on Dec. 15 and will begin his new duties Jan. 1. He went to Frankford from Fort Wayne on July 16, 1924, succeeding M. P. Royal, who was transferred to Kokomo.

SAM HALEY, assistant general counsel for the Missouri Public Service Commission, has resigned from that post. He accepted the post Oct. 16, but did not resign as Federal Prohibition Director at St. Louis for Missouri and Arkansas. He will continue to fill the federal post.

WILLIAM F. CROWE was appointed assistant to the president of the Springfield Street Railway and Worcester Consolidated Street Railway of Springfield and Worcester, Mass. This appointment was effective on Nov. 22.

S. A. MORRISON, formerly superintendent of freight service of the Chicago, South Shore & South Bend Railroad, Michigan City, Ind., has been promoted to the position of assistant general superintendent. Mr. Morrison has had many years of supervisory operating experience, particularly with the Chicago & Northwestern line besides his term of service with the South Shore line.

# Thomas Fortune Ryan

**Last of the group of financiers which included Messrs. Whitney, Widener, Elkins and others died in New York on Nov. 23**

THOMAS FORTUNE RYAN, the last of the group of financiers and railway promoters that included, among others, Messrs. Whitney, Widener, Elkins, Dolan and Yerkes, died in New York on Nov. 23. He was 77 years old. For many years before his death Mr. Ryan had not been active in business, but his interests during his active life had been manifold. He had a hand in the financing of electric railways, steam railroads, public utilities as exemplified in the electric light and power industry, in gas, and in tobacco and other manufacturing concerns. In the field of philanthropy he did his part in his later years. In politics he was both prominent and powerful.

Mr. Ryan is a subject for an analyst with the capacity of a Gamaliel Bradford. In business he was distinguished by wide vision and native shrewdness. He was a product of the age that was portrayed in the "Lion and the Mouse," and of the day that supplied the background for the "Titan" and "The Financier." For that very reason much that Mr. Ryan did must remain an enigma to the present generation, since most of his active career closed before the new conception of big business made headway against habit and conservatism.

Among his achievements were the saving of the Equitable Life Assurance Society in 1905, and his participation in the organization of the American Tobacco Company, acquisition of the Broadway street railway franchise in New York as the keystone for the Metropolitan Street Railway, acquisition of the Third Avenue Railroad in New York, after its former owners had been forced to the wall, and the formation of the Metropolitan Securities Company to hold securities in which Mr. Ryan and his associates were interested.

The stakes in New York were big. Mr. Ryan and his associates saw their surface lines threatened by the new subways with Mr. Belmont at their head. In such circumstances the astute managers of the Metropolitan Street Railway conceived the bold plan of seeking rights for competitive rapid transit lines for themselves. It was Mr. Ryan's move. Only a few years before Mr. Belmont alone had been prepared to leap into the deep waters of rapid transit, but now Mr. Ryan was apparently prepared to follow. Perhaps he was, but as a matter of fact Mr. Ryan's proved only to be a gesture after all. As James Blaine Walker says in "Fifty Years of Rapid Transit," it was not long until the cat was let out of the bag and the financial district rang with the story of how Mr. Ryan had forced Mr. Belmont into a merger by the threat of constructing a new subway to be operated in competition with the underground road into which Mr. Belmont had put his millions. This virtually marked the exit of Mr. Ryan from the transit scene in New York.

It could never be said of Mr. Ryan as it was of Jim Fisk and others that he was one of the playboys of "The Gilded Age." Mr. Ryan stuck sturdily to his last. In all of his many guises he kept the public at a distance—as stock broker, street railway promoter, pilot of the New York traction combinations of the period just before the turn of the century, adventurer at intervals into Western and Southern railroading, reorganizer of gas and electric companies, head of the tobacco trust,



*Wide World Photo*

**Thomas Fortune Ryan**

absorber of banks, pioneer in the development of the Congo, buyer of the powerful Equitable Life Assurance Society in the day of its trouble, astute politician, and occasional lavish contributor to charity and art.

When all is said and done, probably Mr. Ryan's most important public benefaction was the purchase of the Equitable Life Assurance Society. After the Armstrong legislative investigation of life insurance companies in New York State and its revelations of extravagance and scandal and the passage of remedial legislation, Mr. Ryan was one of the leaders in a movement to protect the interests of the policyholders. At his request, Grover Cleveland, former president of the United States, Morgan J. O'Brien and George Westinghouse consented to act as trustees and straighten out the affairs of the society. Mr. Ryan regarded this work as a public trust and from his brief control of the society derived no personal profit.

Mr. Ryan was born in Virginia on Oct. 17, 1851, and, as he could get no schooling beyond that afforded by occasional sessions under uncertain hill-country pedagogues, he determined as a small boy to do a lot of studying on his own account. At the age of seventeen he left home to start business life in a city. That was in 1868. He got a clerkship in the Baltimore store of John D. Barry, whose daughter, Ida M., he married in 1873. But Baltimore was too small for him; it has been related that he broke his customary silence to say as much to a fellow store employee. He moved to New York in 1874, became a curb broker, and, within a year, bought a seat on the Stock Exchange. The start on his meteoric career had been made.

## "Dan" Smith

"Dan" Smith of Detroit, Mich., soldier, politician, business man, and municipal-ownership advocate, died on Nov. 25. Thus ended a career short in years but extensive in its range of pursuit and intensive in purpose. Known to the electric railway industry at first through his connection with the Peter Smith Heater Company, he was in the puhlic eye in 1921 when as mayoralty candidate opposing Mayor Couzens for re-election he flayed the policies of the municipal street railway chiefs and characterized the plan as "a program which was conceived in ignorance and executed in extravagance." He stood for municipal ownership when operated on economic lines. Nevertheless, for all his disclosures of waste and secretive handling of the Detroit municipal railway project the citizens of Detroit at the polls on Nov. 8 of that year showed their approval of Mayor Couzen's administration and indorsed his re-election.

Dan Smith was born in Detroit, 53 years ago, the son of Peter Smith, the inventor of the well-known heating appliances. In 1907 he became president of the Peter Smith Heater Company and more recently president of the Sattley Coin Counting Machine Company, in both of which enterprises he remained interested until his death. But they were only a part of the man's interests. Mr. Smith had long taken an active part in the various military organizations of the state of Michigan and of the country. First as private he was later to do honor as quartermaster-sergant, captain, adjutant and adjutant-general, seeing active service in Cuba and Mexico and in intention, though not in actuality, in France—for he was on the high seas when the armistice terminating the World War was signed. He never lost contact with soldiers of fortune or rather soldiers of misfortune, for he had made numerous bequests to retired needy soldiers.

In railway association activities Mr. Smith served as chairman of the exhibit committee in 1916 when the American Electric Railway Association had its first exhibit under its own auspices. Nor did he ever actually dissever his connection with transportation. For it is recalled that of late years he has been traveling around in a Lucullian palace on wheels—a bus built for himself which he used for business purposes and as a delectable pastime. It was exhibited at a recent annual convention of the association. He is also recalled by many for his becoming yearly a "newsboy," selling papers on the streets of Detroit for needy families.

# Activity of Equipment Market Continues

## Cleveland Railway plans to rehabilitate 750 cars. St. Louis Public Service contemplates new tracks. Several large orders for track and line materials

DESPITE the seasonal decrease in orders of material and supplies, large projects and purchases continue to be made. Estimates on the cost of equipping 750 old-type street cars with Timken axles, individual leather seats, electric heaters, modern lighting and ventilation, and the newest safety devices are being obtained by the Cleveland Railway, Cleveland, Ohio. According to Joseph H. Alexander, president, the popularity of the 100 new street cars put into service on the Cleveland lines recently, as evidenced by the increased riding, was sufficient indication that increased riding on all of the lines can be expected if all of the cars are modernized. When the estimates are obtained for each type of car in use, a study will be made to determine whether the cost will be warranted, taking into consideration the probable life of each car.

### Catenary for Cleveland Terminal

The Fort Pitt Bridge Works Company, Pittsburgh, Pa., has been awarded the contract for the fabrication and erection of the structural steel catenary bridges to be used in the electrification of the approaches to the Cleveland Union Terminal, Cleveland, Ohio. The contract specifies that the work is to be completed by June 1, 1929. The catenary bridges are to be built along the right-of-way of the Nickel Plate, New York Central and Belt Line Railroads, between Collinwood and the Union Terminal Station on the east, and along the right-of-way of the Big Four between Linndale, and the terminal station on the west.

Improvement of Poplar Avenue from Third to Dunlap Streets, Memphis, Tenn., has just been started. Permits have been obtained by the Memphis Street Railway allowing it to replace old track and repave the street. The project will cost $90,000.

Plans for a new loop at the end of the Grand Avenue division of the St. Louis Public Service Company, St. Louis, Mo., and Virginia Avenue and Meramec Street, are being considered by that company and the St. Louis Board of Aldermen. Under the new plan the Grand Avenue cars would turn north at Meramec Street and Louisiana Street for about a block, and then over private property of the car company to Virginia Avenue, and south to Meramec Street. The extension of the natural bridge line westward to Pine Lawn has been delayed until the city is ready to proceed with the widening of Natural Bridge Avenue.

The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has placed orders for 48,000 ft. of rail, 20,100 paving bricks and 81,600 lb. of asphalt. Other equipment ordered by this company includes 2,896 tie plates and 534 ties.

The Twin City Rapid Transit Company, Minneapolis, Minn., has placed orders for 50,000 paving bricks, three left-hand 200-ft. C. R. mates, 15 ft. long, of 7-in. construction, six left-hand 75-ft. standard mates, 12 ft. long, of 7-in. construction, and six right-hand 75-ft. standard switches 12 ft. long of 7-in. construction. The Gary Railways, Gary, Ind., has just completed its track rehabilitation program on South Broadway, between Little Calumet and 40th Avenue, over the line of the Gary & Southern Traction Company. The pavement between 35th Street and 40th Avenue is of 9-in. crushed stone with tar product penetration.

The Memphis Street Railway, Memphis, Tenn., has just completed its Jackson Avenue extension to University Place. The new section is 1⅛ miles long and costs $70,000. Double tracks have been laid as far as McLean Boulevard, and single tracks from there to University Place terminus.

The Worcester Consolidated Street Railway, Worcester, Mass., has completed the relocation of its tracks on Chandler Street, which was made necessary by the widening of the street. This construction costs approximately $40,000. This company has also renewed five frogs and one switch at the corner of Pleasant and West Streets, at an approximate cost of $1,600. $6,000 was spent for double-track renewals at Billings Square.

### Line Materials

Twenty-five miles of No. 00 grooved trolley wire, 5,475 ft. of 1,000,000 circ.mil, paper-insulated, lead-covered 600-volt cable, and one two-section blue Vermont feeder panel top section has been ordered by the Twin City Rapid Transit Company, Minneapolis, Minn. Ten cars of poles, one car of weatherproof wire, and one car of cable have been ordered by the Milwaukee Electric Railway & Light Company, Milwaukee, Wis. Cape Breton Electric Company, Sydney, N. S., contemplates the purchase of track and line material for maintenance use.

Fifty General Electric 213 railway motor gear blanks, 12,000 ft. of 1-in. Magnolia lumber, and 12,000 ft. of 1x6-in. white and red oak have been ordered by the Twin City Rapid Transit Company for the remodeling of cars. The Milwaukee Electric Railway & Light Company has purchased five second-hand passenger cars and is remodeling 40 cars into one-man safety cars. The Cape Breton Electric Company has ordered five used Birney single-truck cars and is remodeling three two-man double truck cars to one-man operation. This company has ordered three sets of safety car equipment including air brakes and electrical automatic equipment and 48 cross seats for three cars. Power equipment ordered by this company includes five new 150-hp. boilers and 75,000 firebrick. The Milwaukee Electric Railway & Light Company is building a second floor addition to its Broadway garage.

## New Birney Car Tested in East St. Louis

The new Birney car was given its first official test on Nov. 8, over the lines of the East St. Louis Railway, East St. Louis, Ill., in the presence of prominent Mid-West representatives, officials of the local railway systems, electric railway and manufacturers' representatives.

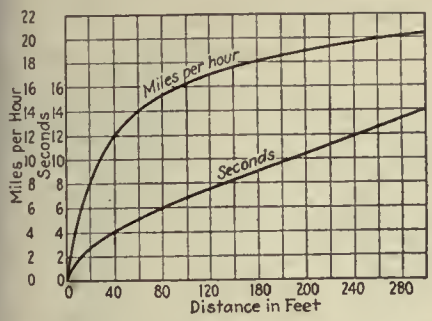
This is the latest invention of C. O. Birney, superintendent of car construction for Stone & Webster, Inc., known throughout the industry as the "Father of the Safety Car," and who for the last fifteen years has offered numerous improvements in street railway practice and design.

The new Birney car was built by the St. Louis Car Company and its trial in East St. Louis offered the visitors the opportunity to study its performances before it is shipped to Houston, Tex., to be placed in regular service. The local demonstration was made from Third and Broadway over the Lansdowne division and back to the local carhouse at Twentieth and State Streets.

Opportunity was afforded all those attending to inspect the trucks and underneath construction of the car from a pit in the East St. Louis shops.

Within the new Birney, which seats 39 passengers, there is an air of luxury. All interior finish is mahogany. Sheet rubber with a mosaic pattern covers the floor, and all seats in the car are of the deep spring design, covered with hand-buffed leather. The car is the one-man type and has full safety equipment. Automobile type visors and bumpers and the low roof give the car a striking resemblance to a large motor coach.

The car accelerated from a standing point to 20 m.p.h. in five seconds and




**Speed attained and time required by Birney car during acceleration for a given distance**

deceleration rated up to 4 miles per second.

The tests show a maximum accelerating rate of 2.4 m.p.h.p.s. for conditions where there is a severe drop in voltage. This is about what might be expected on properties where the voltage conditions are not good. Where the voltage is good throughout the system, accelerating rates of 4 to 5 m.p.h.p.s. may be attained if every condition for acceleration is at its best.

Braking rates up to 4.0 m.p.h.p.s. may be attained with sand on wet rails. Emergency rates of 2.5 m.p.h.p.s. from the "dead man" handle and 3.0 from the brake valve were obtained with bad rail conditions in the rain, aided by sand.

In giving his opinion of the new car to the group on the trial run, G. W. Welsh, vice-president and general manager of the East St. Louis Affiliated Railway System, pointed out that both the driving mechanism and the design represented radical departures from the standard street car as it is now known to the public.

"More than ten years ago," he said, "Mr. Birney invented what is known as the safety car, which is now being used extensively on small city properties all over the country. The new Birney car is designed to find its place in the transportation field between Birney's safety car and the larger double-truck cars now in use in St. Louis and East St. Louis. Its quick acceleration, light weight and attractive appearance will undoubtedly appeal to operators who see in these qualities something with which to compete with present day transportation agencies."

Those who attended the demonstration were entertained at luncheon by the St. Louis Car Company at the Missouri Athletic Club, presided over by Mr. Meissner, president. After the luncheon an interesting discussion followed, during which Mr. Birney mentioned that this car was built in less than 30 working days in order to show it at the A.E.R.A. convention at Cleveland. He took occasion to thank the various manufacturers, particularly, Westinghouse Electric & Manufacturing Company, Westinghouse Air Brake Company, National Pneumatic Company, Johnson Fare Box Company and the St. Louis Car Company for their co-operation.

The following attended the demonstration:

Kansas City Railway, Kansas City, Mo., D. L. Fennell, general superintendent transportation, R. W. Bailey, general superintendent power and labor, R. S. Neal, superintendent of equipment, D. E. Druen, superintendent bus maintenance.

St. Joseph Light & Power Company, C. A. Semrad, vice-president and general manager, F. E. Henderson, superintendent of railway, Theodore Riesemme, master mechanic, Mr. Johnson.

Louisville Railway, Louisville, Ky., Samuel Riddle, vice-president.

Illinois Power & Light Company, Decatur, Ill., M. L. Harry, general manager.

Illinois Power & Light Corporation, Peoria, Ill., R. F. Palmblade, manager, A. T. Leech, master mechanic.

Illinois Power Company, Springfield, Ill., A. D. Mackie, vice-president.

Milwaukee Railway & Light Company, Milwaukee, Wis., John Lucas, superintendent rolling stock.

Kentucky Traction & Terminal Company, Lexington, Ky., D. M. Carr, superintendent equipment, H. Busch, superintendent transportation.

Chicago Rapid Transit Company, Chicago, Ill., D. E. Brittan, engineer.

St. Louis Public Service Railway Company, St. Louis, Mo., Samuel Greenland, general manager, Major Lockwood, assistant general manager, M. O'Brien, master mechanic, A. Finck, transportation engineer, Mr. Jones, Mr. Wright.

Springfield Traction Company, Springfield, Mo., A. E. Reynolds, vice-president and general manager.

East St. Louis Railway, East St. Louis, Ill., G. W. Welsh, vice-president, W. C. Myers, general superintendent, L. W. Jacques, master mechanic, E. H. Slater, assistant engineer, H. P. MacDonald, superintendent automotive equipment, H. Niemoeller, assistant engineer, N. J. Albright, advertising manager, L. G. Leake, general storekeeper, F. O. Whiteman, superintendent service.

Stone & Webster, Inc., C. O. Birney, superintendent car construction.

J. Grause, Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., L. W. Stemrich, Westinghouse Electric & Manufacturing Company, St. Louis, Mo., O. A. Broten, National Pneumatic Company, Chicago, Ill., Otis Turner, General Electric Company, E. Davis, Westinghouse Traction Brake Company, Joseph Dapron, Westinghouse Traction Brake Company, Clarence Brown, Westinghouse Traction Brake Company, J. E. Lytle, *Electric Traction*, Donald Heinly, ELECTRIC RAILWAY JOURNAL, F. H. Ingalls, St. Louis *Times*, Edwin B. Meissner, president St. Louis Car Company, L. F. Seelar, chief engineer St. Louis Car Company, L. W. Richards, St. Louis Car Company, H. R. Cass, St. Louis Car Company, M. J. Oswald, St. Louis Car Company, Frank Grayson, Grayson Supply Company, William Grayson, Grayson Supply Company.

## Welded Metal Ties Used on Switches

A recently completed spur connecting the General Electric plant at Schenectady, N. Y., with the Delaware & Hudson Railroad has wooden ties replaced with those of metal.

The feasibility of metal ties was suggested by the General Electric Company, early in 1927, when it announced that it had designed automatic welding machinery which could produce metal ties. The Delaware metal tie fabricating shop at Colonie, N. Y., which produced the ties used in this installation is built around an automatic arc welding machine designed and built by the General Electric Company. Its present output is about 20,000 ties per year. Not only were the switches and cross-overs mounted on metal ties, but the switch stands themselves were mounted on extra long metal ties. By a simple arrangement the base on which a switch stand is fastened is welded to the ties, resulting in a firmly fastened stand, but allowing its easy removal for replacement or repair if necessary.

For this special construction, scrap rails, cut to the proper lengths, were delivered on the spot and there welded by hand and installed under the track. The railroad crew foreman in charge of the installation claimed that not only was the work simplified with the metal tie, but that he could do a much better job with more permanent, beneficial results.



**Metal ties of greater length are used where one track leaves another at a switch, being common to both sets of track**

A particularly advantageous consideration, it was found, developed in connection with the installation of the cross-overs. Where one track left another at a switch, metal ties of greater length were used, a single tie being common to both sets of track for quite a distance from the switch.

## Secretary of Commerce Makes Annual Report

According to the annual report of the Secretary of Commerce the fiscal year ending June 30 continued the high economic activity which has been characteristic of American industry during recent years. There was a slight recession during the latter part of the calendar year 1927, but this was fully recovered during the first six months of 1928. As a result of this temporary reduction in activity, however, several of the indicators of business conditions show for the fiscal year 1927-28, as a whole, an average a little below the peak levels of 1926-27, although almost every one of them stood materially higher than during such prosperous years as 1923-24 and 1924-25. The slackening of business in the earlier months of the fiscal year just closed was due to special and temporary causes, among others the damage caused by the great Mississippi flood, the prolongation of the effect of the low price of cotton of the crop of 1926, and the temporary shutdown of certain large motor-vehicle plants for readjustment of models. At the close of the fiscal year 1927-28 business in nearly all branches was on a level rarely, if ever, before attained. The volume of production and consumption for the year, as a whole, and the physical quantity of exports and imports were very large, unemployment was relatively unimportant, and the rate of real wages and the standard of living of the masses of the people remained higher than anywhere else in the world.

The general index of manufacturing production, perhaps the most comprehensive measure of business conditions, average 2 per cent lower than the year before and 1 per cent lower than in 1926. It was, however, higher than in any fiscal year before 1926. The relatively slight degree to which industrial activity had been temporarily cut down is indicated by the fact that the index of production of manufactured goods in November, at the lowest point reached, was only 2 per cent below the average for the three years 1923 to 1925. By January, 1928, the index had already been restored to its normal and progressing level, output being 9 per cent greater than in November. Indeed, the first half of the calendar year 1928, taken as a whole, showed greater production in our factories than any corresponding period theretofore.

Mineral production in 1926-27 was abnormally great, partly because of the demand for coal, caused by the British mining strike, and partly by reason of an unduly rapid expansion of petroleum output which was generally considered contrary to the public interest. The falling off in aggregate mineral production during the fiscal year just closed was therefore entirely to be expected; output, nevertheless, remained greater than in any year before 1926-27. The decline in railway traffic last year was in considerable part due to this smaller movement of coal.

The indexes of electric-power production, of building construction, and of the sales of department stores, chain stores, and mail-order houses all showed increases in the last fiscal year as compared with that preceding and most of them were the highest ever recorded.

The foreign trade of the United States in the fiscal year 1927-28 has continued that expansion in the export of manufactured goods which has been a conspicuous feature in the economic life of the United States during the past seven years.

Further progress in the elimination of waste has resulted from continued co-operation among the many branches of industry and commerce. The department has participated, when requested, in this general effort by assembling and distributing economic information, investigating economic and scientific problems, and otherwise assisting the several groups to reach common understanding and solution of their difficulties.

## METAL, COAL AND MATERIAL PRICES F.O.B. REFINERY

| | Nov. 27, 1928 |
|---|---|
| **Metals—New York** | |
| Copper electrolytic, cents per lb. | 15.775 |
| Copper wire, cents per lb. | 17.875 |
| Lead, cents per lb. | 6.35 |
| Zinc, cents per lb. | 6.675 |
| Tin, Straits, cents per lb. | 52.75 |
| **Bituminous Coal, f.o.b. Mines** | |
| Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons. | $4.375 |
| Somerset mine run, f.o.b. mines, net tons. | 1.875 |
| Pittsburgh mine run, Pittsburgh, net tons. | 1.80 |
| Franklin, Ill., screenings, Chicago, net tons. | 1.425 |
| Central, Ill., screenings, Chicago, net tons. | 1.15 |
| Kansas screenings, Kansas City, net tons. | 1.625 |
| **Materials** | |
| Rubber-covered wire, N. Y., No. 14, per 1,000 ft. | $5.5 |
| Weatherproof wire base, N. Y., cents per lb. | 18.625 |
| Cement, Chicago net prices, without bags. | 2.05 |
| Linseed oil (5-bbl. lots) N. Y., cents per lb. | 10.8 |
| White lead in oil (100-lb. keg), N. Y., cents per lb. | 13.2 |
| Turpentine (bbl. lots), N. Y., per gal. | 0.67 |

## Miller Schorn Incorporates

Incorporation of the Miller Schorn Rapid Transit System, Detroit, Mich., developer of the rapid transit plan on which the East Jefferson Avenue express service in Detroit is based, was announced recently. Capitalization was announced at 1,000 shares, no par value, and offices of the concern were given as 338 Lafayette Boulevard.

Officers are: Harry R. Miller and Nicholas J. Schorn, inventors of the plan, and H. M. Gould, former general manager of the Detroit Municipal Railway, who completed the D. S. R. traffic survey a year ago.

## Additional Safety Gates for North Shore

A new type of automatic electrically-operated safety gate, which has proved highly successful in practical tests at three locations on the Chicago, North Shore & Milwaukee Railroad, Chicago, Ill., will be installed at 26 grade crossings along the railroad between Niles Center, Ill., and Racine, Wis., according to an announcement by John R. Blackhall, general manager.

## TRADE NOTES

Electric Storage Battery Company, Philadelphia, Pa., recently announced the appointment of Albert N. Dingee as advertising manager to succeed the late Alfred B. Kreitzburg. Mr. Dingee has been in the sales department of the company for the past eighteen years.

Wagner Electric Corporation, St. Louis, Mo., announces the removal of its Los Angeles branch office and service station to 1220 South Hope Street. The removal involves all local departments.

Barney G. Tang, assistant general superintendent of the Schenectady Works of the General Electric Company, has been made general superintendent to succeed James A. Smith, who died Oct. 25. John D. Harnden, former superintendent of the testing department, has been appointed assistant to the works manager, F. L. Kemp succeeding him as superintendent of the testing department, and Leroy Beers has been made plant engineer, a newly created position under the works manager.

Wagner Electric Corporation, St. Louis, Mo., announces that H. N. Felton, branch manager of the Milwaukee office since 1927, has been made branch manager of the New York office.

## ADVERTISING LITERATURE

I-T-E Circuit Breaker Company, Philadelphia, Pa., has just published a new bulletin, No. 220, covering a new type of electrical protective equipment, the U-Re-Lite All-Steel Distribution Groups.

Hydraulic Society, New York, N. Y., has published the fifth edition of the Standards of the Hydraulic Society. The principal changes from the preceding edition are a revision of the extracts taken from the A.S.M.E. test code for centrifugal and rotary pumps and changes in materials recommended for the construction of special service pumps, in line with the latest accepted practice.





# GOOD
## *to the last link!*

It's the last few links of chain that determine whether the brakes will hold. If the hand brake clogs at this important point, it's about as useless as an open car in a Canadian snow storm.

Peacock Staffless Brakes are so designed that they have an unlimited capacity for slack chain; they never clog. And this one point alone makes them the choice of leading operators throughout the country—for safety's sake.

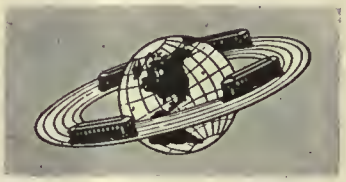
# PEACOCK
# Staffless Brakes

**National Brake Company, Inc.**
890 Ellicott Square Buffalo, N. Y.

*Canadian Representative:*
Lyman Tube & Supply Co., Ltd., Montreal, Can.
The Ellcon Co., General Sales Representatives
50 Church St., New York



"CAR CARD ADVERTISING
ALMOST EVERYWHERE"

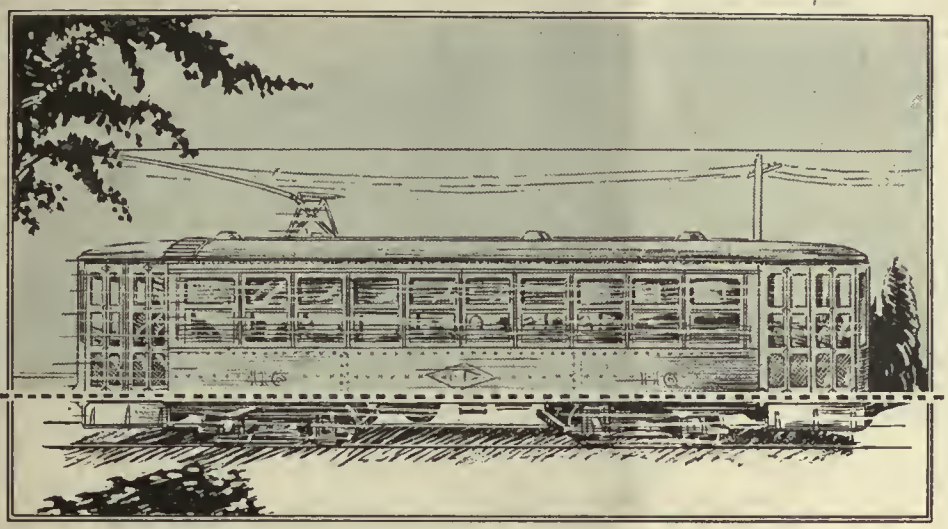


ELECTRIC railway executives have been solving transportation problems and meeting the needs of the people every day, summer and winter, rain and shine, for many decades. No other group is so eminently qualified to economically render proper mass transportation.

The ability to maintain any service as a real asset can only be proven by a long period of successful operation.

BARRON G. COLLIER
INCORPORATED

NEW · YORK · CITY




# Carnegie Products will be of help in securing passenger satisfaction

Modern traffic conditions—big cars, heavy loads, accelerated starting and emergency stopping—throw an ever-increasing burden on equipment. The use of Carnegie Products will aid in bringing your equipment up to the requirements of present day transportation. Passengers are quick to appreciate smoothly running, efficiently operated cars. Thus in modernizing you reap an important by-product in their satisfaction.

**Carnegie Wrought Steel Wheels** assure high resistance to the wear and tear of traffic today. They are made of a high carbon steel by a special process of rolling and forging that refines the steel, insuring a homogeneous structure, free from irregularities that might cause trouble.

**Carnegie Axles.** More than 60 years of experience in the manufacture of axles, coupled with every facility for correct heat treatment and accurate testing, insure the meeting of the specification in the finished product.

**Carnegie Steel Cross Ties,** properly laid, insure a comfortable-riding, repair-free track. Interrupted service, due to track repairs, is eliminated. The unit cost (cost per foot of track per year) is considerably lower than for wood ties.

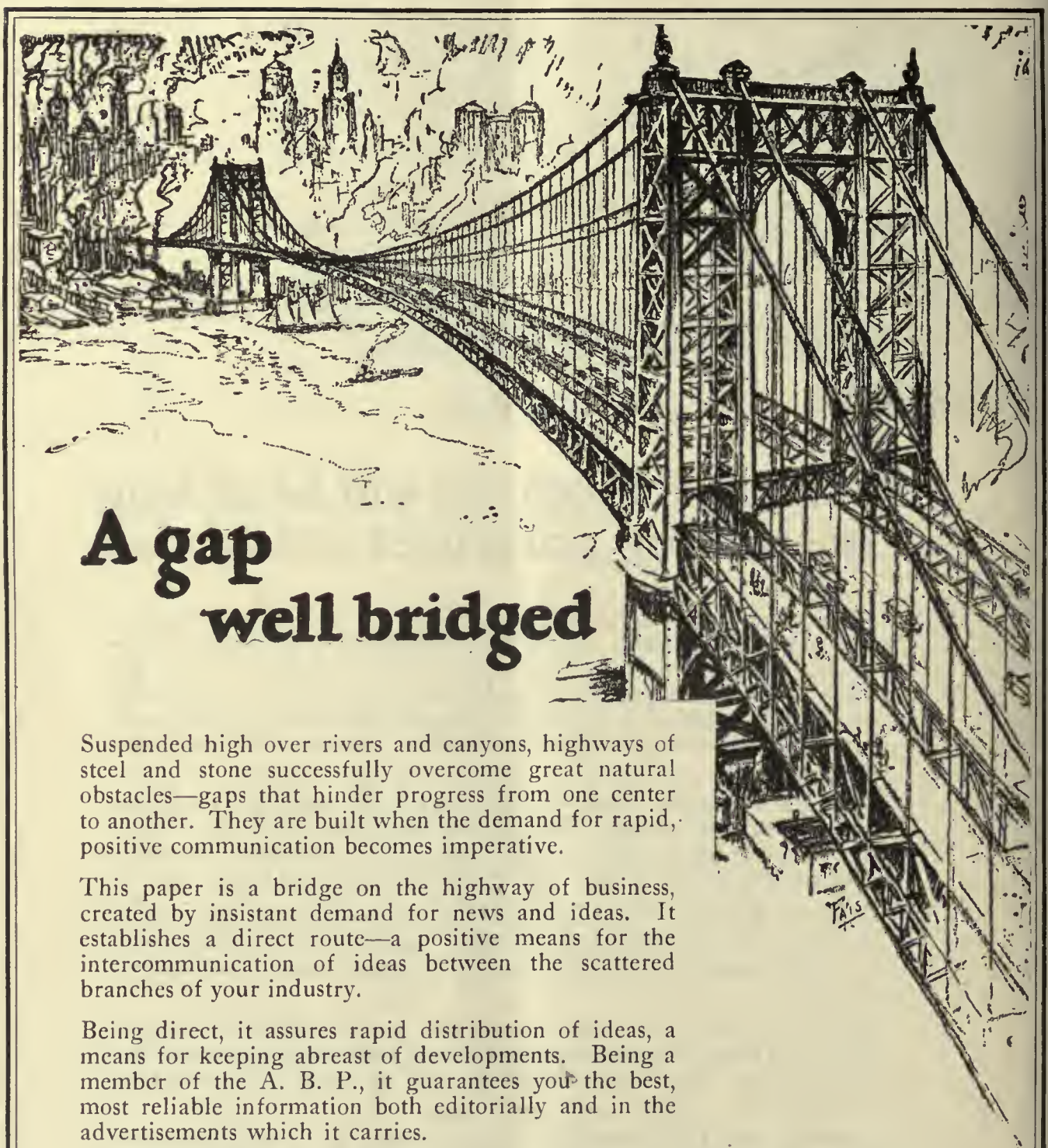
**Carnegie Rails and Rail Joints.** Carnegie tee rails and splices, suitable for interurban track, are available in standard sizes and weights. Extensive manufacturing facilities permit us to serve you promptly and efficiently.

*Descriptive literature on request.*

## CARNEGIE STEEL COMPANY

*Subsidiary of the* UNITED STATES STEEL CORPORATION
General Offices: Carnegie Building
PITTSBURGH, PENNA.

1947



# A gap well bridged

Suspended high over rivers and canyons, highways of steel and stone successfully overcome great natural obstacles—gaps that hinder progress from one center to another. They are built when the demand for rapid, positive communication becomes imperative.

This paper is a bridge on the highway of business, created by insistant demand for news and ideas. It establishes a direct route—a positive means for the intercommunication of ideas between the scattered branches of your industry.

Being direct, it assures rapid distribution of ideas, a means for keeping abreast of developments. Being a member of the A. B. P., it guarantees you the best, most reliable information both editorially and in the advertisements which it carries.

Take the shortest and best route to up-to-the-minute news. This A. B. P. paper leaves no gap in supplying information which is helpful to you in the conduct of your business.

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Executive Offices, 52 Vanderbilt Ave., New York, N. Y.

A.B.P.

*An association of none but qualified publications reaching the principal fields of trade and industry.*

Illinois Traction





United Electric Ry.

Philadelphia Rapid Transit



# Continuous Track Circuits

ARE the safest means of providing Automatic Block Signal Protection on Electric Railways. "Union" Automatic Signals ensure faster Car operation, greater protection and increased public confidence.

TRADE MARK Union Switch & Signal Co. TRADE MARK

SWISSVALE, PA.

# AMERICAN BRIDGE COMPANY

71 Broadway, New York



*Highway Bridge across Russian River at Guerneville, Cal.*

*Manufacturers of Steel Structures of all classes, particularly*

## BRIDGES AND BUILDINGS

HIGHWAY BRIDGES

POWER HOUSES BOILER HOUSES

ROOF TRUSSES COLUMNS, GIRDERS

*Offices in Principal Cities*

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## Railway and Utility Supplies

Castings—Grey Iron, Brass and Aluminum

Forgings
Special Machinery and Patterns

Machine and Sheet Metal Work

Armature and Field Coils.

*The* Columbia Machine Works *and M. I. Co.*
265 Chestnut St., corner Atlantic Ave.,
Brooklyn, New York

## Griffin Wheel Company
410 North Michigan Ave.
Chicago, Ill.

# Griffin Wheels

## with Chilled Rims and Chilled Back of Flanges For Street and Interurban Railways

FOUNDRIES:

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| Chicago | Boston | St. Paul |
| Detroit | Kansas City | Los Angeles |
| Denver | Council Bluffs | Tacoma |
| Cleveland | Salt Lake City | Cincinnati |



## Complete satisfaction

Operating perfectly and requiring minimum attention for maintenance and lubrication, Earll Catchers and Retrievers give genuinely satisfactory results. Their refinement of design, and mechanical superiority are summarized in the following five features, peculiar to Earll construction.

No-wear Check Pawl
Free-Winding Tension Spring
Ratchet Wind
Emergency Release
Perfect Automatic Lubrication

## Earll Catchers and Retrievers

C. I. EARLL, York, Pa.

*Canadian Agents:*
Railway & Power Engineering Corp., Ltd., Toronto, Ont.
*In All Other Foreign Countries:*
International General Electric Co., Schenectady, N. Y.

# Used and Surplus Equipment

INDIVIDUAL items of used equipment, or surplus new equipment, or complete plants, are disposed of (and found) through advertising in the *Searchlight* Section of this paper.

This is the section which so effectively aided the Government in selling the many millions of dollars worth of surplus material and equipment accumulated during the war without disturbing the market.

# "SEARCHLIGHT"

# LORAIN

Girder Rails, Special Trackwork, Switches, Frogs and Crossings in Solid Manganese Steel, Manganese Insert Construction, Chrome Nickel Steel Insert Construction and Built-up Construction of all heights and weights of rail

## The Lorain Steel Company

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

General Offices: Johnstown, Pennsylvania

*Sales Offices:*

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Pacific Coast Representatives: U. S. Steel Products Co., San Francisco, Seattle, Portland, Los Angeles
Export Representatives: United States Steel Products Co., New York

## PANTASOTE

TRADE MARK

—the car curtain and upholstery material that pays back its cost by many added years of service. Since 1897 there has been no substitute for Pantasote.

## AGASOTE

TRADE MARK

—the only panel board made in one piece. It is homogeneous and waterproof. Will not separate, warp or blister.

*Standard for electric railway cars and motor buses*



*Samples and full information gladly furnished.*



The PANTASOTE COMPANY, Inc.
250 Park Avenue, NEW YORK

## ELECTRICAL INSULATION

PERFECT MICANITE INSULATOR and PERFECT EMPIRE INSULATION

Micanite and Super-Micanite Sheets, Commutator Segments, and Commutator Rings

Micanite Tubes and Washers

Linotape, Seamless or Sewn Bias *(Yellow or Black Varnished Tapes)*

Empire Oiled Cloths and Papers *(Yellow or Black)*

Compounds, Varnishes Etc.

*Send for catalog and helpful booklet on Commutator Insulation and Assembly*

MICA INSULATOR COMPANY

*Largest manufacturers in the world of mica insulation.*
*Established 1893.*

New York: 200 Varick St. Chicago: 542 So. Dearborn St.
Cleveland Pittsburgh Cincinnati Seattle
San Francisco Toronto Montreal Los Angeles
*Works: Schenectady, New York. London, England*

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**Ford, Bacon & Davis**
Incorporated
**Engineers**
39 Broadway, New York
PHILADELPHIA CHICAGO SAN FRANCISCO

**The J. G. White Engineering Corporation**
Engineers — Constructors
Steam and Hydro-Electric Power Plants, Gas Plants, Steam and Electric Railroads, Transmission Systems, Buildings and Industrial Plants.
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Incorporated
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Industrial and Public Service Properties
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**THE BEELER ORGANIZATION**
Transportation, Traffic, Operating Surveys
Better Service—Financial Reports
Appraisals—Management
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**SANDERSON & PORTER**
ENGINEERS
PUBLIC UTILITIES & INDUSTRIALS
Design Construction Management
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**ENGELHARDT W. HOLST**
*Consulting Engineers*
Appraisals Reports Rates Service Investigation
Studies on Financial and Physical Rehabilitation
Reorganization Operation Management
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**ALBERT S. RICHEY**
ELECTRIC RAILWAY ENGINEER
WORCESTER, MASSACHUSETTS
REPORTS - APPRAISALS - RATES - OPERATION - SERVICE

**J. ROWLAND BIBBINS**
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Valuations, Rate Cases and Ordinances
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VALUATION AND FINANCIAL REPORTS
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CONSTRUCTION AND MANAGEMENT OF ELECTRIC RAILWAYS
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*Railway and Highway Consulting Engineers*
An organization of experienced engineers, prepared to assist you in the installation of highway operations as a substitute for or a supplement to your rail operations.
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CONSULTING ENGINEERS
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CONSULTING ENGINEERS
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Operating Problems Valuations Traffic Surveys
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Incorporated
ENGINEERING AND CONSTRUCTION
Examinations—Reports—Valuations
Transportation Problems—Power Developments
68 TRINITY PLACE NEW YORK

*Your Own Knowledge Plus Engineering Service*

A strong combination that gets to the root of perplexing transportation problems and accurately determines the answer.

It pays to bring to the business of transportation the skilled touch of specialization available through groups of transportation engineering specialists.

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PRESIDENT

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Chicago . . . Youngstown, O.

*A Personalized Service*



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Brake Pins
Brake Hangers
Brake Levers
Pedestal Gibs
Brake Fulcrums
Turnbuckles
Case Hardened Bushings
Center Bearings
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Bolster and Transom Chafing Plates
Manganese Brake Heads
Manganese Truck Parts
Forgings
Bronze Bearings
McArthur Turnbuckles
Trolley Pins

Can be purchased through the following representatives:

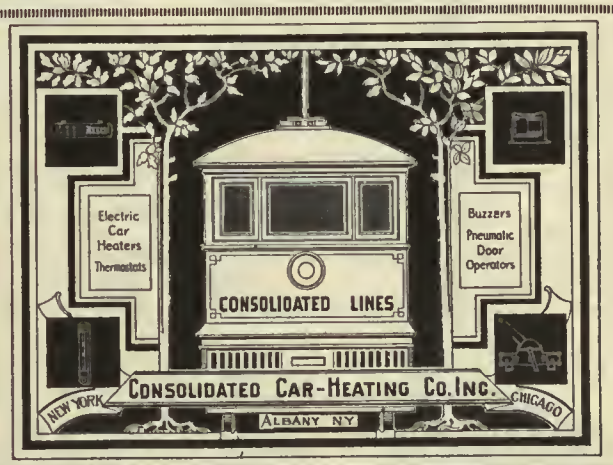
F F. Bodler,
903 Monadnock Bldg., San Francisco, Cal.

W. F. McKenney,
54 First Street, Portland, Oregon.

J. H. Denton,
1328 Broadway, New York City, N. Y.

A. W. Arlin,
519 Delta Bldg., Los Angeles, Cal.

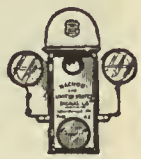
Bemis Car Truck Company
Springfield, Mass.




THE P. EDWARD WISH SERVICE
50 Church St. NEW YORK
*Street Railway Inspection* DETECTIVES
131 State St. BOSTON

When writing the advertiser for information or prices, a mention of the Electric Railway Journal would be appreciated.

NACHOD & UNITED STATES SIGNAL CO., INC.
LOUISVILLE, KY.
BLOCK SIGNALS
FOR
ELECTRIC RAILWAYS
HIGHWAY CROSSING SIGNALS



ROEBLING
Electrical Wires & Cables
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RAIL JOINTS
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WELDING ROD
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Efficient Bus Heating
*with*
**The N-L Venti-Duct Heater**
THE NICHOLS-LINTERN CO.
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*Gets Every Fare*
PEREY TURNSTILES
or PASSIMETERS
Use them in your Prepayment Areas and Street Cars
Perey Manufacturing Co., Inc.
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A. STUCKI CO.
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GOLD CAR HEATING & LIGHTING CO.
220 36th St., Brooklyn, N. Y.
ELECTRIC HEATERS WITH OPEN COIL OR ENCLOSED ELEMENTS
THERMOSTAT CONTROL—VENTILATORS
WRITE FOR NEW CATALOGUE

# That electrical fact you want

*—is here*

For every man in electrical work

This is the one standard electrical help containing all the data, kinks, short-cuts, helps and other information that the practical electrician, wireman, lineman, contractor, plant superintendent and construction engineer needs.

*Croft's*

## American Electricians' Handbook

By TERRELL CROFT

*823 pages, flexible, pocket size, 900 illustrations. $4.00 net, postpaid*




The book is brimful of those facts which every man engaged in electrical work needs to know.

Think how much help you would be able to get from a convenient pocket-size handbook that gives you in one book—

Practical suggestions for locating and correcting both motor and generator troubles—

Clear directions for proper installation and operation of motors and generators—

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*Make 1928 pay you— Mail this coupon now!*

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Send me Croft's American Electricians' Handbook, $4.00 net, postpaid, on 10 days' approval. I agree to pay for the book or return it postpaid within 10 days of receipt.

(To secure book on approval print your name plainly and fill in all lines.)

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Black Varnished Silk, and Varnished Cambric, Yellow Varnished Paper

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**Irvington Varnish & Insulator Co.**

Irvington, N. J.

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## BOXES for BUSES

Let us tell you of this especially designed box for this class of service.

**The Cleveland Fare Box Co.**

**4900 Lexington Ave., Cleveland, O.**

**Canadian Cleveland Fare Box Co., Ltd.**

**Preston, Ontario**

COIN COUNTING And Sorting Machines CHANGE CARRIERS Tokens

B. A. HEGEMAN, Jr. President H. A. HEGEMAN, First Vice-Pres. and Treas.
F. T. SARGENT, Secretary J. M. PRATT, Vice-Pres. in charge of sales

## National Railway Appliance Co.

**Graybar Building, 420 Lexington Ave., New York**

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Munsey Bldg., Washington, D. C. 100 Boylston St., Boston, Mass.
Hegeman-Castle Corporation, Railway Exchange Building, Chicago, Ill.
F. F. Bodler, 903 Monadnock Bldg., San Francisco, Calif.
Lister-Reese Inc., 401 S. Brand Blvd., Glendale, Calif.

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Tool Steel Gears and Pinions
Anglo-American Varnish Co., Varnishes, Enamels, etc.
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Genesco Paint Oils
Dunham Hopper Door Device
Garland Ventilators
Walter Tractor Snow Fighters
Feasible Drop Brake Staffs
Ft. Pitt Spring & Mfg. Co., Springs
Bell Register Fare Boxes
Fraser Gas Electric Drive
Flaxlinum Insulation
Economy Electric Devices Co. Power Saving and Inspection Meters
National Safety Devices Company's Whistle Blowers, Gong Ringers and Brake Hangers
Godward Gas Generators
Cowdrey Automotive Brake Testing Machine
Tru-Drum Lathe




Double Register Type R-11

## International Registers

Made in single and double types to meet requirements of service. For hand or foot, mechanical or electric operation. Counters, car fittings, conductors' punches.

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**15 South Throop Street, Chicago, Illinois**

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*Positions Wanted*, 4 cents a word, minimum 75 cents an insertion, payable in advance.

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INFORMATION:

*Box Numbers* in care of any of our offices count 10 words additional in undisplayed ads.

*Discount* of 10% if one payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

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1 to 3 inches.....$4.50 an inch
4 to 7 inches..... 4.30 an inch
8 to 14 inches..... 4.10 an inch

Rates for larger spaces, or yearly rates, on request.

An *advertising inch* is measured vertically on one column, 3 columns—30 inches—to a page.

R.J.

### POSITIONS WANTED

GENERAL executive, fifteen years' successful experience, construction, maintenance, operation, management; seeks connection with a future. PW-147, Electric Railway Journal, Tenth Ave. at 36th St., New York.

STREET railway superintendent, also bus operator, will be open for employment about January first. Experienced in disposing of street railway equipment and installing buses. Speaks Spanish; is electrical and mechanical engineer. Can go anywhere. PW-148, Electric Railway Journal, Tenth Ave. at 36th St., New York.

## WANTED

**WANTED**

**5 Second Hand Birney Cars**

in good operating condition. Trucks Brill 79-E, Westinghouse 508-A Motors, K-63 Br. Controllers, General Electric C. P. 25 Air Equipment.

SIOUX CITY SERVICE COMPANY,
524 Nebraska St., Sioux City, Iowa

FOR SALE

**5 BIRNEY CARS**

Less than three years old, 70,000 miles, double end, single truck, excellent condition, G. E. equipped pneumatic operated doors, 32 passengers, built on Brill Co.'s Miami specifications. Details furnished on request.

CITY COMMISSION, Coral Gables, Fla.

**SEARCHLIGHT SERVICE SECURES SATISFACTORY SALES**

# How to dispose of surplus stocks of new replacement and repair parts and materials?

A question of unusual interest to the executives of all electric railways, particularly Purchasing Agents and Storekeepers.

Write the Searchlight Department of the *Electric Railway Journal*, 10th Ave. at 36th St., New York, N. Y., if you are interested in working out a plan that will aid in the distribution of this material. Include a brief review—on a quantity or value basis—of the material you have.

# WHAT AND WHERE TO BUY

**Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors Advertising in this Issue**

This index is published as a convenience to the reader. Every care is taken to make it accurate, but *Electric Railway Journal* assumes no responsibility for errors or omissions.

**Advertising, Street Car**
Collier, Inc., Barron G.

**Air Brakes**
General Electric Co.
Westinghouse Air Brake Co.

**Anchors, Guy**
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

**Armature Shop Tools**
Columbia Machine Works
Elec. Service Supplies Co.

**Automatic Return Switch Stands**
Ramapo Ajax Corp.

**Automatic Safety Switch Stands**
Ramapo Ajax Corp.

**Axles**
Bemis Car Truck Co.
Bethlehem Steel Co.
Brill Co., The J. G.
Carnegie Steel Co.
Cincinnati Car Co.
Illinois Steel Co.
Standard Steel Works Co.
Westinghouse E. & M. Co.

**Babbitting Devices**
Columbia Machine Works

**Badges and Buttons**
Elec. Service Supplies Co.
International Register Co.

**Barges, Steel**
American Bridge Co.

**Batteries, Dry**
Nichols-Lintern Co.

**Bearings and Bearing Metals**
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works
Westinghouse E. & M. Co.

**Bearings, Center & Roller Side**
Columbia Machine Works
Stucki Co., A.

**Bells and Buzzers**
Consolidated Car Htg. Co.

**Bells and Gongs**
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works
Elec. Service Supplies Co.

**Benders, Rail**
Railway Track-work Co.

**Bodies, Bus**
Brill Co., The J. G.

**Bolts, Case Hardened**
American Steel Foundries
Bemis Car Truck Co.

**Bolts & Nuts, Track**
Illinois Steel Co.

**Bond Testers**
American Steel & Wire Co.
Electric Service Supplies Co.

**Bonding Apparatus**
American Steel & Wire Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Railway Track-work Co.
Una Welding & Bonding Co.

**Bonds, Rail**
American Steel & Wire Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Railway Track-work Co.
Una Welding & Bonding Co.
Westinghouse E. & M. Co.

**Brackets & Cross Arms (See also Poles, Ties, Posts, etc.)**
American Bridge Co.
Columbia Machine Works
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.

**Brake Adjusters**
American Steel Foundries
Brill Co., The J. G.
Cincinnati Car Co.
National Ry. Appliance Co.
Westinghouse Tr. Br. Co.

**Brake Shoes**
Bemis Car Truck Co.
Brill Co., The J. G.
Wheel Truing Brk. Shoe Co.

**Brakes—Bk. Systems & Parts**
American Steel Foundries
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works
General Electric Co.
National Brake Co.
Westinghouse Tr. Br. Co.

**Brakes, Magnetic Rail**
Cincinnati Car Co.

**Bridges, Steel**
American Bridge Co.

**Brushes, Carbon**
General Electric Co.
Westinghouse E. & M. Co.

**Brushholders**
Columbia Machine Works
General Electric Co.

**Buildings, Steel**
American Bridge Co.

**Bunkers, Coal**
American Bridge Co.

**Buses**
General Electric Co.
Graham Bros.

**Bushings, Case Hardened & Manganese**
American Steel Foundries
Brill Co., The J. G.
Bemis Car Truck Co.
Cincinnati Car Co.
Columbia Machine Works

**Cables, (See Wires & Cables**

**Cambric Tapes, Yellow and Black Varnish**
General Electric Co.
Irvington Varnish & Ins. Co.
Mica Insulator Co.

**Carbon Brushes**
(See Brushes, Carbon)

**Car Lighting Fixtures**
Elec. Service Supplies Co.

**Car Panel Safety Switches**
Consolidated Car Heat. Co.
Westinghouse E. & M. Co.

**Car Steps, Safety**
Cincinnati Car Co.

**Car Wheels, Rolled Steel**
Bethlehem Steel Co.

**Cars, Dump**
Brill Co., The J. G.
Differential Steel Car Co.

**Cars, Gas-Electric**
Brill Co., The J. G.
General Electric Co.
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(Continued on page 36)

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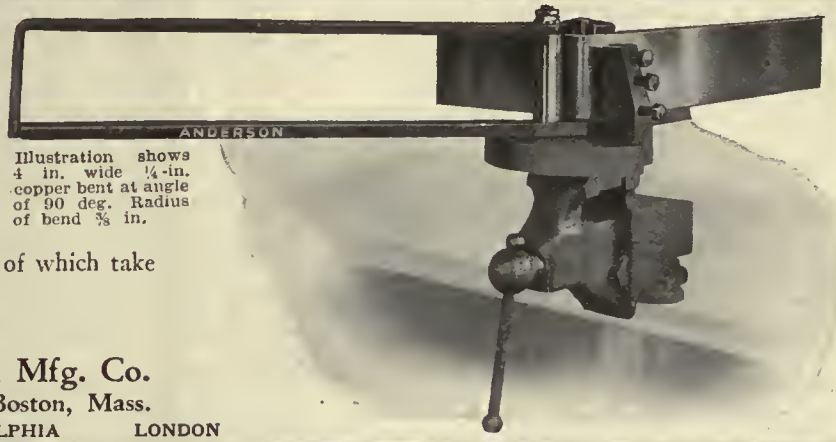


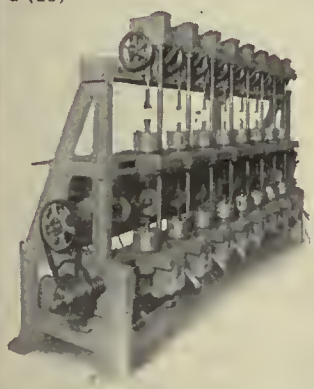

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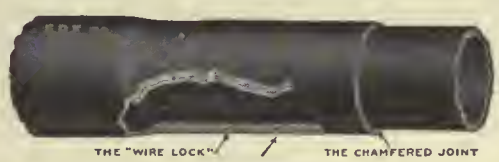
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Elec. Service Supplies Co.
Railway Track-work Co.

**Towers and Transmission Structures**
American Bridge Co.
Westinghouse E. & M. Co.

**Track Grinders**
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Ramapo Ajax Corp

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Columbia Machine Works
Ramapo Ajax Corp.

**Trackless Trolley Cars**
Brill Co., The J. G.

**Transfer Tables**
American Bridge Co.

**Transformers**
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**Treads, Safety Stair Car Steps**
Cincinnati Car Co.

**Tree Wire**
Okonite Callender Cable Co.
Okonite Co.

**Trolley Bases**
Ohio Brass Co.
Westinghouse E. & M. Co.

(Continued on page 38)




Don't Take Cars Out Of Service To Turn Worn Wheels

THE WHEEL TRUING BRAKE SHOE does the work while your car is in service. Don't jeopardize your schedules by excessive pull-ins owing to wheel troubles. Use Wheel Truing Brake Shoes and keep the maximum equipment in service. They save time, labor and money.

WHEEL TRUING BRAKE SHOE CO.
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*Sales Offices:* New York Chicago Pittsburgh St. Louis Atlanta Birmingham San Francisco Los Angeles Seattle
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F. D. Lawrence Electric Co., Cincinnati, O.
Novelty Electric Co., Phila., Pa.
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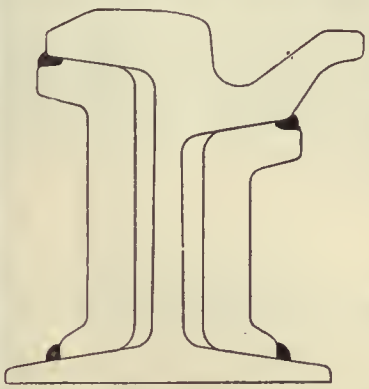


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and overhead registers make possible the instantaneous registering and counting of every fare. Revenues are increased 1½ to 5% and the efficiency of one-man operation is materially increased. Over 5000 already in use.

**Johnson Fare Box Co.**
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The Rail Joint Co.
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Advertisements for the
## Searchlight Section



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*Rod, Wire and Cable Products*

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PS HEATERS

*Car Heating and Ventilating*

—are no longer operating problems. We can show you how to take care of both with one equipment. The Peter Smith Forced Ventilation Hot Air Heater will save, in addition, 40% to 60% of the cost of any other car heating and ventilating system. Write for details.

The Peter Smith Heater Company
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National Ry. Appliance Co.

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Nichols-Lintern Co.
Railway Utility Co.

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Una Welding & Bonding Co.

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Ohio Brass Co.
Railway Track-work Co.
Una Welding & Bonding Co.
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**Welders, Rail Joint**
General Electric Co.
Ohio Brass Co.
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**Welding Processes and Apparatus**
Ohio Brass Co.
Railway Track-work Co.
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Westinghouse E. & M. Co.

**Welding Steel**
Railway Track-work Co.
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**Welding Wire**
American Steel & Wire Co.
Railway Track-work Co.
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**Welding Wire and Rods**
Railway Track-work Co.

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**Wheel Grinders**
Wheel Truing Brk. Shoe Co.

**Wheel Presses (See Machine Tools)**

**Wheels, Car, Cast Iron**
Griffin Wheel Co.

**Wheels, Car, Steel & Steel Tired**
American Steel Foundries
Bemis Car Truck Co.
Carnegie Steel Co.
Illinois Steel Co.
Standard Steel Works Co.

**Wheels, Trolley**
Columbia Machine Works
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Star Brass Works

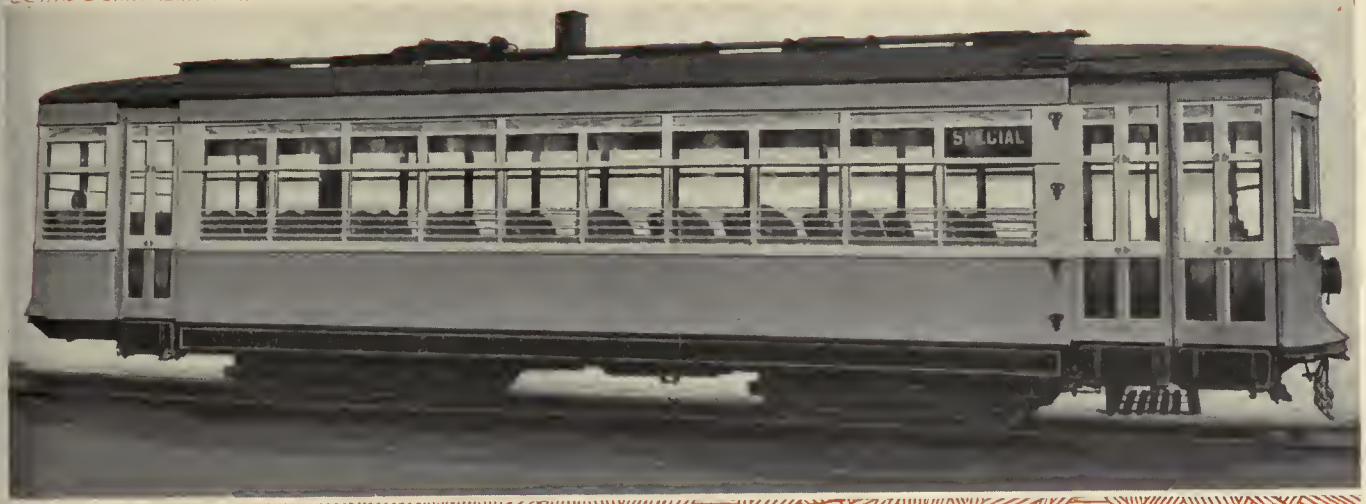
**Wheels, Wrought Steel**
Carnegie Steel Co.
Illinois Steel Co.

**Whistles, Air**
Ohio Brass Co.
Westinghouse E. & M. Co.
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**Window Guards and Fittings**
Cincinnati Car Co.

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Anaconda Copper Mining Co.
Okonite Co.
Okonite-Callender Cable Co.
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Westinghouse E. & M. Co.




# Modernization Pays in El Paso

The El Paso Electric Company serves the cities of El Paso, Texas and Juarez, Mexico. In 1927 this company purchased seven new cars from the American Car Company. This was the initial step in an attempt to popularize their service. These cars are of the double-truck, single-end, one-man type with automatic treadle-operated rear exit doors.

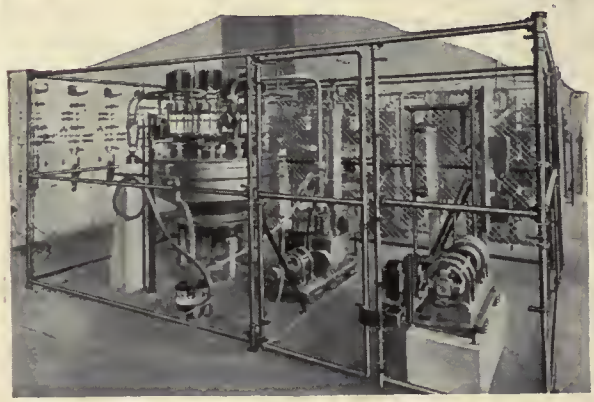
According to the records of the company, the higher acceleration and improved loading and unloading facilities of these cars permitted an increase in speed from 10.3 to 11.9 m.p.h. This has made possible the handling of as many passengers on a line with five cars as formerly were hauled with seven cars. And it is apparent that the public is riding in the cars to a greater extent than formerly.

This is further evidence that improved service with Brill equipment will popularize car riding.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. ST. LOUIS, MO. — G.C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.
Pacific Coast Representative: Rialto Bldg., San Francisco

# BRILL MODERN CARS

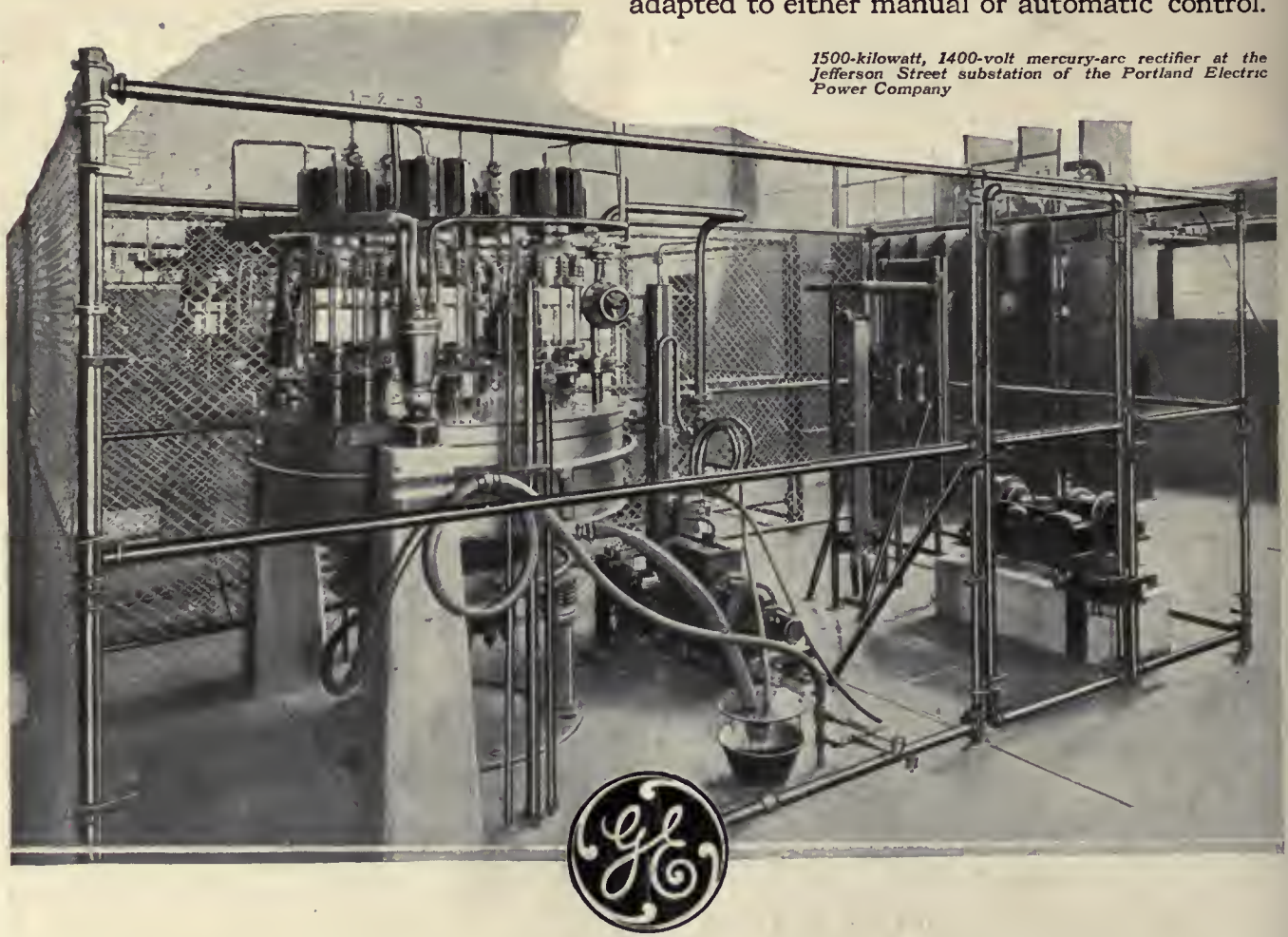
# For the modern substation—the G-E power rectifier



The many installations of G-E mercury-arc rectifiers on railways have demonstrated their advantages for substation service.

The research facilities of the General Electric laboratories have made the steel-tank, mercury-arc rectifier available in sizes suitable for railway substations operating at 600, 1200, 1500, and 3000 volts.

This type of converting equipment gives a very pronounced improvement in efficiency over a wide range of loads, particularly at the higher direct-current voltages. Its operation has been shown to be reliable and practical, and it is adapted to either manual or automatic control.




*1500-kilowatt, 1400-volt mercury-arc rectifier at the Jefferson Street substation of the Portland Electric Power Company*

130-10

# GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

ELECTRIC RAILWAY JOURNAL

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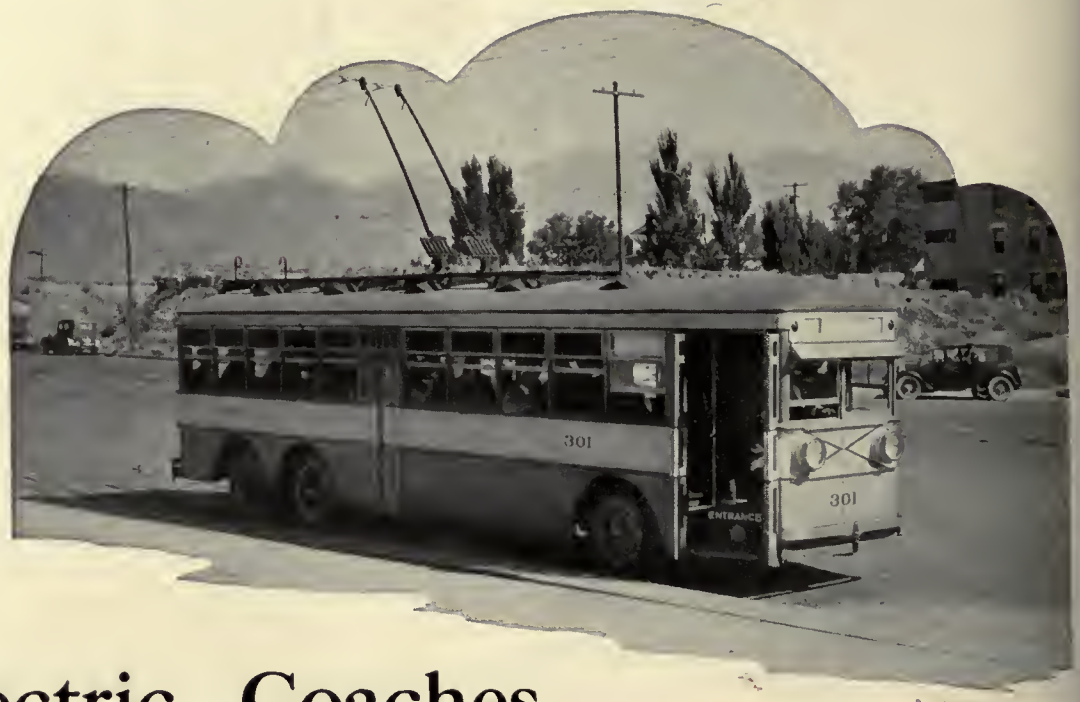
For high-carbon forged steel wheels are *stronger*. By reason of spoke-type design, they are *cooler* and do not melt up tire mileage. *Cleaner*, too, and quieter. Chassis noises cannot be amplified. *Simple, positive* locking is another great advance.

Make any test you please—be convinced.

MOTOR WHEEL CORPORATION, Lansing, Mich.

*Write for descriptive literature*

by Motor Wheel




# New Electric Coaches

## Increase Receipts at Salt Lake City

OPERATION of eleven modern trolley coaches recently placed in service in Utah's capital city has resulted in approximately 25 per cent increase in receipts.

This is due largely to the reliable service and extremely comfortable riding qualities afforded by the luxuriously fitted street-car type electric coach.

These facts bear out the recommendation of Westinghouse engineers that the electric coach has its application in urban service where the density of passenger traffic is not sufficient to warrant street car operation.

Some of the advantages of electric coach operation are:

1. Elimination of track investment and paving charges incident thereto in many communities.
2. The use of cheap electric power and existing substation and distribution equipment.
3. Low operating and low maintenance costs.
4. High schedule speeds, due to concentration of power and unlimited power supply.
5. Quiet operation and adequate maneuvering ability.

Westinghouse motor and control equipment for electric coaches has proved its worth, and Westinghouse representatives are prepared to discuss with you the application of these modern vehicles.

### Comparative Operating Costs

Cents per mile

| | Electric Coach | Gasoline Bus |
|---|---|---|
| Ways and Structures | 1.64 | .01 |
| Maintenance | 7.26 | 12.63 |
| Power or Fuel | 2.32 | 3.46 |
| Conducting Transportation | 10.18 | 12.47 |
| General | 3.55 | 3.57 |
| Total | 24.95 | 32.14 |
| Passenger Revenue | 22.28 | 14.59 |

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania

Sales Offices in All Principal Cities of the United States and Foreign Countries

MEMBER A.E.E. A.E.R.A. C.E.A. 1928

# Westinghouse

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# Electric Railway Journal

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1928

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December 8, 1928

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BY WALTER JACKSON

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# SELF SERVICE CARS

Just as people become quickly accustomed to operating automatic elevators, slot machines, lunch rooms, etc., so have they adapted themselves to the use of treadles for opening surface car doors. The treadle is not only a factor in modernization but also in public relations.

NP NP

# TREADLE-IZE!

NATIONAL PNEUMATIC COMPANY

*Executive Office:* Graybar Building, New York

*General Works:* Rahway, New Jersey

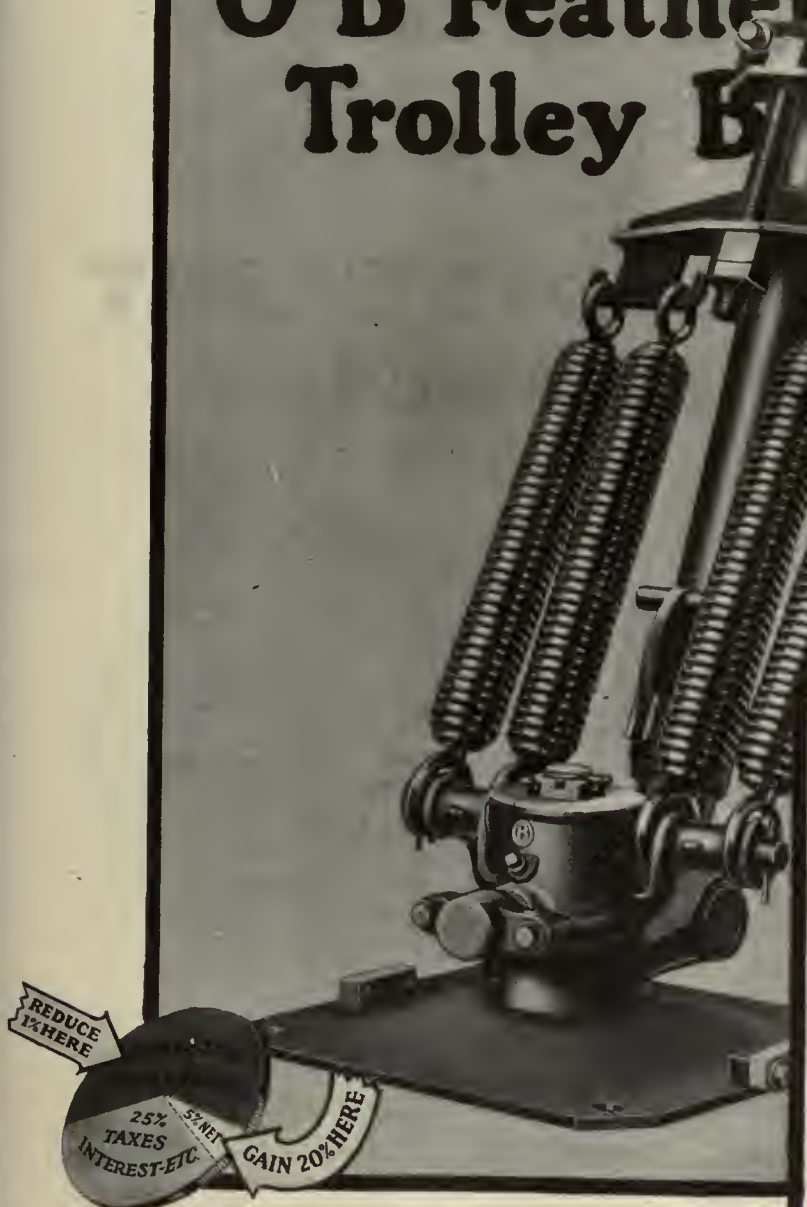
CHICAGO
518 McCormick Building

MANUFACTURED IN TORONTO, CANADA, BY
Railway & Power Engineering Corp., Ltd.

PHILADELPHIA
1010 Colonial Trust Building

# DOLLARS AND SENSE! URGE ~

## O-B Featherweight Trolley Base




THE modern lighter weight car requires a lighter trolley base—a demand met by the O-B Featherweight Trolley Base—a base of extreme simplicity, unusual stamina and much lighter weight. The use of steel throughout makes for greater strength —*yet this base weighs only 73 pounds.* Timken Roller Bearings, balanced spring construction, and longer trolley pole support are service improvements which insure maximum efficiency of operation with a minimum of maintenance. Instant acceptance by the industry justifies the urge that you consider the O-B Featherweight Trolley Base in connection with new car plans as well as car maintenance programs. Details on page 56 of Supplement No. 2 to O-B Catalog No. 20.

**Ohio Brass Company, Mansfield, Ohio**
Canadian Ohio Brass Co., Limited
Niagara Falls, Canada
984C

Modern cars, modern equipment and modern operation are proved means for reducing operating expense. "Dollars and Sense" savings thus effected are a big step toward increased "net" profits.

# Ohio Brass Co.

NEW YORK CHICAGO PHILADELPHIA PITTSBURGH ATLANTA CLEVELAND SAN FRANCISCO LOS ANGELES

PORCELAIN INSULATORS
LINE MATERIALS
RAIL BONDS
CAR EQUIPMENT
MINING MATERIALS
VALVES



One of the cars to which Simplex Clasp Brakes have been applied

# SIMPLEX MULTIPLE UNIT CLASP BRAKES

Railroads would not purchase passenger cars without "Simplex Clasp Brakes."

Why not specify "Simplex Multiple Unit Motor and Trailer Truck Clasp Brakes" for Gas — Electric and Electric Cars.

Send us your inquiries for information and designs.

The mechanically correct Brake for a Modern Car.

**AMERICAN STEEL FOUNDRIES**

NEW YORK CHICAGO ST. LOUIS

# Try this prescription for trolley worries



## Samson Spot Trolley Cord

—The cord with the colored spots is specially made to meet *all* conditions of exposure found in electric railway service.

Here are some of its advantages:

Smoothly braided
Pliable
Waterproof
Uniform in Thickness
Guaranteed free from rough places
*Will not* kink, swell or shrink
Free running and will wear for years.




## —and Keystone Trolley Catchers

The new type Keystone Trolley catchers have these new and important features:

Universal oiling system with large oil reservoir
Larger rope capacity and a larger reel
Increased size of openings allowing free movement of rope
Simpler method of rope attachment
Positive catch assured by a new method of mounting pawls

Here's an unbeatable combination—try it out on your cars.

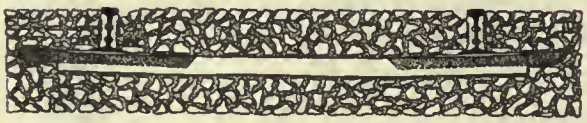
Home office and plant at 17th & Cambria Sts., PHILADELPHIA; District Offices at 111 N. Canal St., CHICAGO; 50 Church St., NEW YORK; Bessemer Bldg.; Pittsburgh; 88 Broad St., Boston; General Motors Bldg., Detroit; 316 N. Washington Ave., Scranton; Canadian Agents, Lyman Tube & Supply Company, Ltd., Montreal, Toronto, Vancouver.

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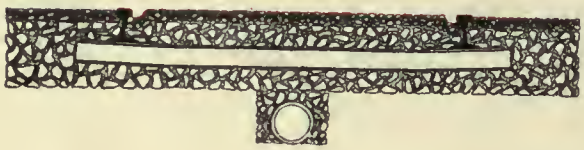
MANUFACTURER OF RAILWAY, POWER AND INDUSTRIAL ELECTRICAL MATERIAL

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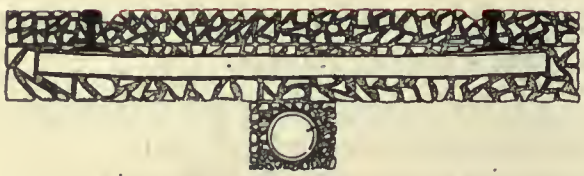
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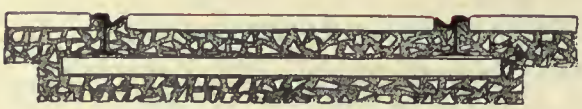
CINCINNATI



KANSAS CITY



DETROIT



PHILADELPHIA

WHEN cities like these build paved track they build for the maximum of permanence—and profit. Steel Twin Ties give maximum results—proved through years of service under the heaviest traffic — acknowledged by the biggest properties in the country today.

The use of Steel Twin Ties in paved track construction must give you results that wood ties can never equal. Further, Steel Twin Ties adapt themselves perfectly to *mass production methods* of construction, with the resulting cut in labor costs and time involved.

The table on the opposite page shows the superiority of Steel Twin Ties in bearing value. It is well to remember that the bearing area of 216 square inches per track foot is ten times that necessary for a twenty-five ton car, figuring concrete in compression at two hundred pounds per square inch.

When you follow the leaders in paved track construction you benefit by their extensive, practical knowledge of Steel Twin Tie Track superiority. They demand, and get, maximum results.

# STEEL TWIN

## The Base of Modernization

# LEADERS

# Paved Track Results

## Bearing Values—Various Paved Track Designs

| Type Track | Sq. Inches Bearing Rail on Tie (6″ Base Assumed) | Percent Total Rail Base Area Carried | Sq. Inches Bearing on Ballast | | Sq. Inches of Bearing on Subgrade | | Effective Bearing on Subgrade: Per Cent Per Track Foot 9′ Wide Trench Assumed |
|---|---|---|---|---|---|---|---|
| | | | Per Tie | Per Tr. Ft. | Per Tie | Per Tr. Ft. | |
| 6″x8″x8′0″ Wood Ties 2′0″ Centers on 6″ Stone Ballast | 48 sq. in. | 33½% | 8″x24″ under each rail 384 sq. in. | 192 | 384 * | 192 * | 15% * |
| 8″x14″ Wood Blocks on 3′0″ Centers | 48 sq. in. | 22% | 224 | 74.6 | 720[2] | 240[3] | 18.3%[2] |
| I-Beams 4′0″ Centers 7′ 0″ Long | 36 sq. in. | 12½% | 504 | 126 | 1944[1] | 486[1] | 37½%[1] |
| Twin Tie Construction 6 foot c-c | 216 sq. in. | 50% | 1081.6 | 180.26 | 4301.6 | 716.9 | 55.3% |

NOTE: * Wood tie construction directly on subgrade or with 6″ or less of stone ballast. See page 19, Paved Track Note Book.
[1] 10¼″ Concrete below Rail Base.
[2] Standard Cross Section.



### Less Men—Better Results with Mass Production Machines.

The compression tamper does a better, faster, more dependable tamping job than can be done by any other method. We will gladly arrange for a demonstration, at your convenience.

With the D-S-R Track Layer one man can attach Steel Twin Ties to the rail in fraction of the time formerly required by four men.



Mass production methods in our own plant insure prompt shipment of Steel Twin Ties—our experience in the field will be of help in laying out your 1929 program. Write us today for delivered prices for Steel Twin Ties and let us discuss with you your track construction for the coming year.

THE INTERNATIONAL STEEL TIE CO.
CLEVELAND, OHIO

# TIE TRACK

## Modernize the Track and the Methods

# *The Most Economical*
# Highway and Marine Beacon
## THE NEW
## EVEREADY PORTABLE FLASHER

IT COSTS, on the average, $50 a year to maintain the ordinary red lantern burning kerosene oil.

The new Eveready Portable Flasher costs $10 a year for the Eveready Columbia Dry Batteries necessary to keep it operating steadily.

This is a clear saving of $40 per year. As a matter of fact, the saving will be greater, for the superior warning power of the intermittent flash, and the complete reliability of the flasher, make it possible for one to displace several oil lanterns.

Thus the higher first cost of the flasher is soon covered by the savings it makes possible.

The Eveready Columbia Dry Batteries which furnish current for operation are the standard six-inch size, available everywhere for replacement. When the flasher is operated continuously, a set of Eveready Columbias should last two months. This remarkable life is due to the fact that the intermittent character of the load has been carefully calculated to get the longest possible battery service.



NATIONAL CARBON CO., Inc.
New York, N. Y.

*Branches*
Atlanta Chicago Kansas City
Long Island City San Francisco

*Unit of Union Carbide and Carbon Corporation*

UCC

**EVEREADY**
TRADE MARK
**PORTABLE FLASHER**
*—dry battery operated*

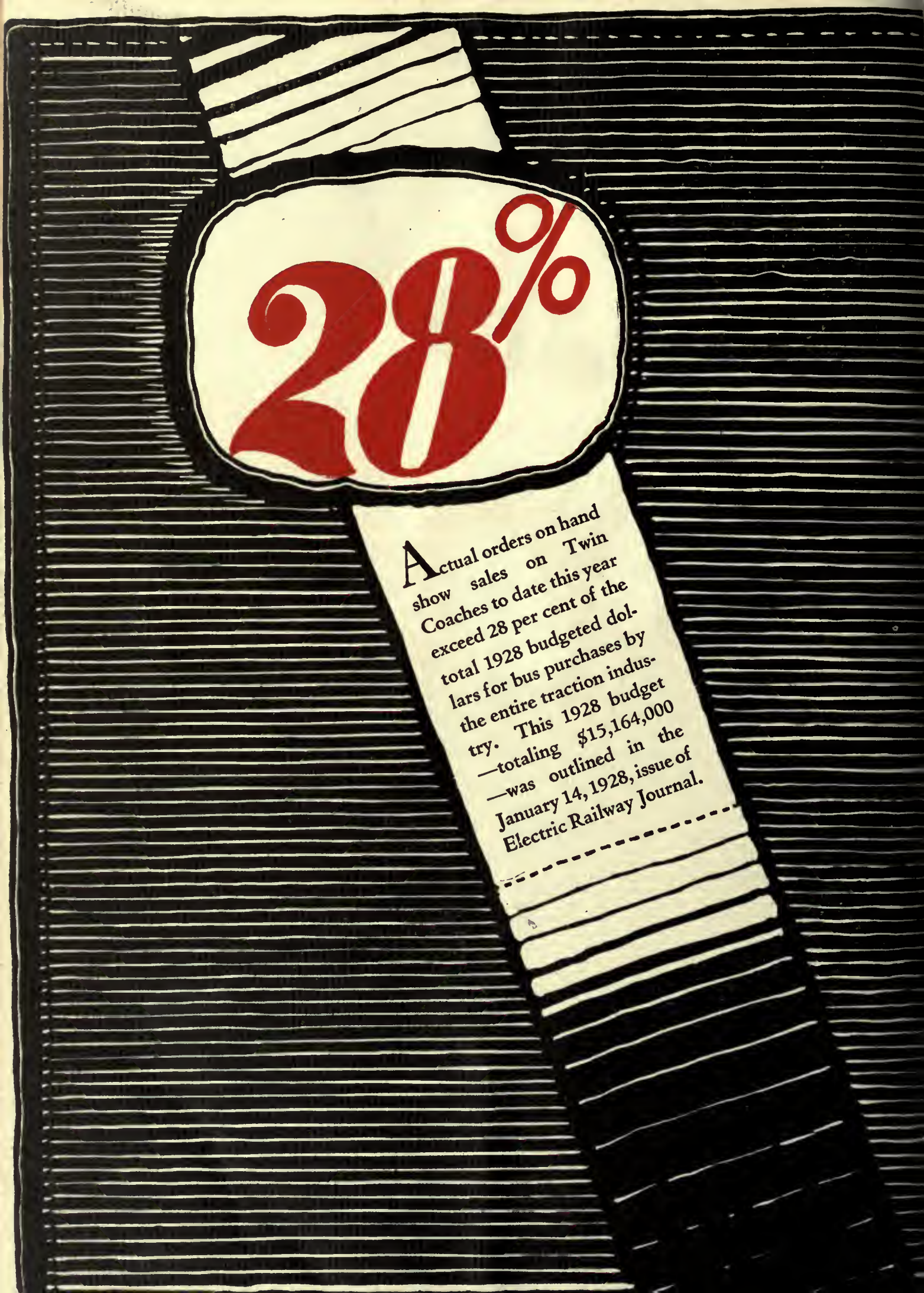


SPECIFICATIONS

Height, 16 inches; diameter of base, 7 inches; weight, including batteries, 16½ lbs. The Eveready Portable Flasher is entirely automatic. Needs no attention other than to replace batteries at intervals of two to three months. Requires four standard Eveready Columbia 6-inch dry cells connected in series to deliver 6 volts. Extra 6-volt Eveready-Mazda Lamp No. 1135 inside battery housing. Battery compartment constructed of seamless steel attractively finished in red. Top of flasher cadmium plated for weather protection. Heavy Fresnel type red glass lens. Padlock for battery compartment with an extra long hasp so that the device can be chained. This flasher is of rugged construction throughout and entirely weather-proof.


again
Okd


AMERICAN · ELECTRIC · RAILWAY
A E
AERA
C T
ASSOCIATION


28%
Actual orders on hand show sales on Twin Coaches to date this year exceed 28 per cent of the total 1928 budgeted dollars for bus purchases by the entire traction industry. This 1928 budget —totaling $15,164,000 —was outlined in the January 14, 1928, issue of Electric Railway Journal.


BOSTON ELEVATED RAILWAY




600%
Bona fide sales of Twin Coaches in six weeks following A.E.R.A. Convention were 600 per cent greater than for the same period of 1927.
Repeat orders continue to come from systems such as Key, Boston Elevated, United Electric, Eastern Michigan, Detroit, Houston Electric, N. O. P. and L. at Akron—generally in fleets of 10 to 20.

# the man from Missouri

*Statement by one of the three leading superintendents of maintenance in American coach operation.*

"The year 1927 was the only one in which we failed to purchase. Radical changes in bus design were being talked about and it became necessary to take the foot off the accelerator and await developments of the proof which would decide the advisability of purchasing Twin Coach buses.

"Like the man from Missouri, we had to be shown, and the year 1928 rolled in before we finally purchased two Twin Coaches. They have long passed the experimental stage with 64,000 miles of operation to their credit, and a reputation of seating 40 passengers. They bid fair to hold the title—'Monarch of the Road.'"

*This official's company has just invested $130,000 in Twin Coaches.*






**$1,300,000 in sales**

–in the Six Weeks that followed the A·E·R·A· Convention


GOODYEAR
N-T-A
SPECIAL

# A "no-axe to grind" OPINION!

***Quoted from Editorial in Electrical World Nov. 3, 1928.***

**(the Italics are ours)**

"Although American Manufacturers for many years showed comparatively little interest in the development of the *mercury-arc rectifier* for *power* applications, conditions have changed recently and this equipment is slowly but surely finding its place in the American Substation. It is *significant* that the companies which have had rectifiers in operation for some time give indication of being *quite satisfied* with the service and of their intention to install *additional* rectifiers in future substations.

. . . experience does not seem to record any great difficulties in maintaining *good* service . . . even in automatic rectifier stations.

The recent detailed report before the A. I. E. E. about satisfactory operation of a number of rectifier stations for Trolley purposes in Connecticut* *deserves the serious consideration of engineers.* It is claimed that they take much less time to start, that the correct division of load among various units is accomplished automatically, that voltage regulation is little more than five percent between no load and full load, and that the maintenance cost is lower than on rotaries." 99

*—and, in the case of*

**A-B-B Mercury-Arc Power Rectifiers,** we might add that operation is silent, that efficiencies on traction voltages are higher, and that only inexpensive foundations are required.*

*Included among the A-B-B Mercury-Arc Rectifiers in Connecticut is the Bridgeport Station, which is the largest rectifier substation in the United States, having a capacity of 10,000 amps. at 600 volts.

ABB

American Brown Boveri Electric Corporation
*Offices In 37 Principal Cities*
Main Plant, Camden, N. J.

**AMERICAN BROWN BOVERI**




# *Modern Cars in Modern Conditions Need Modern Brakes*

Comfortable cars . . . attractive cars . . . convenient cars . . . speedy cars—these are what the modern street railway needs—these are what the up-to-date railway operating official is providing for his patrons.

Modern brakes are making a worthwhile contribution toward improved transportation conditions.

The Westinghouse Variable Load Brake automatically adjusts brake cylinder pressure as car weight changes — permitting maximum retarding rate throughout range of passenger loading. The results are Greater Safety . . . Fewer Delays . . . Faster Schedules.

*The modern brake for modern cars is the Westinghouse Variable Load Brake.*

WESTINGHOUSE TRACTION BRAKE CO.
General Office and Works, Wilmerding, Pa.

# WESTINGHOUSE TRACTION BRAKES

# "Setting Free the Mind as by a Miracle"




*An Advertisement for Bell Long Distance Telephone Service*

In Seattle, Washington, far from home. Homesick. Lingering doubts and apprehension about the welfare of his family in Madison, N. J., 3000 miles away.

He filed a telephone call, and a few minutes later the operator signaled.

A crisp, "Go ahead, please!" and then across the plains, mountains and valleys came to him the reassuring tones of a familiar voice.

"Setting free the human mind as by a miracle," is how this man describes long distance calls.

And business doubts are banished just as quickly. Whether in business or personal matters, telephone calls will quickly clear the worries off your desk and out of your mind. You will be surprised how little long distance calls cost.

Under the new station to station day rates, Los Angeles to Chicago is only $6.25. Denver to St. Louis, $3.50. Miami to Atlanta, $2.80. Dallas to New Orleans, $2.20. Pittsburgh to Cleveland, 80c. Atlantic City to New York, 70c. Baltimore to Philadelphia, 70c. What distant calls could you make to advantage, now?

The station to station day rate from the Statue of Liberty to the Golden Gate is only $9.00. . . . Calling by number takes less time. . . . . *Number, please?*

AMERICAN TELEPHONE & TELEGRAPH CO. AND ASSOCIATED COMPANIES — BELL SYSTEM

# See the


Ready
SAFETY
RAZOR
EVER-READY RAZOR
JEWELRY ON CREDIT
12 MONTHS TO PAY

# Automobiles



A LOT of people, people driving the automobiles in this picture, still think that street car progress stopped long before the war. They've never heard of a modern car. To them, a street car ride is a swaying, slow, stuffy, slam-bang stop and start, ordeal. To them, street car transportation is passé, and they are paying dearly for their mistaken notions.

The only way to sell these people street car transportation is to sell them modern Cincinnati Car transportation. The average person who drives a car to the office or store *would be glad* to take the street car—if only a good, comfortable, speedy ride were assured.

With Cincinnati Cars on your property, automobiles are left at home—your profits jump, your operating costs shoot down.

See the automobiles? There's your competition! Cincinnati cars on your lines today bring back the errant rider, assure your company of increased patronage tomorrow.

THE CINCINNATI CAR CO.
CINCINNATI, OHIO

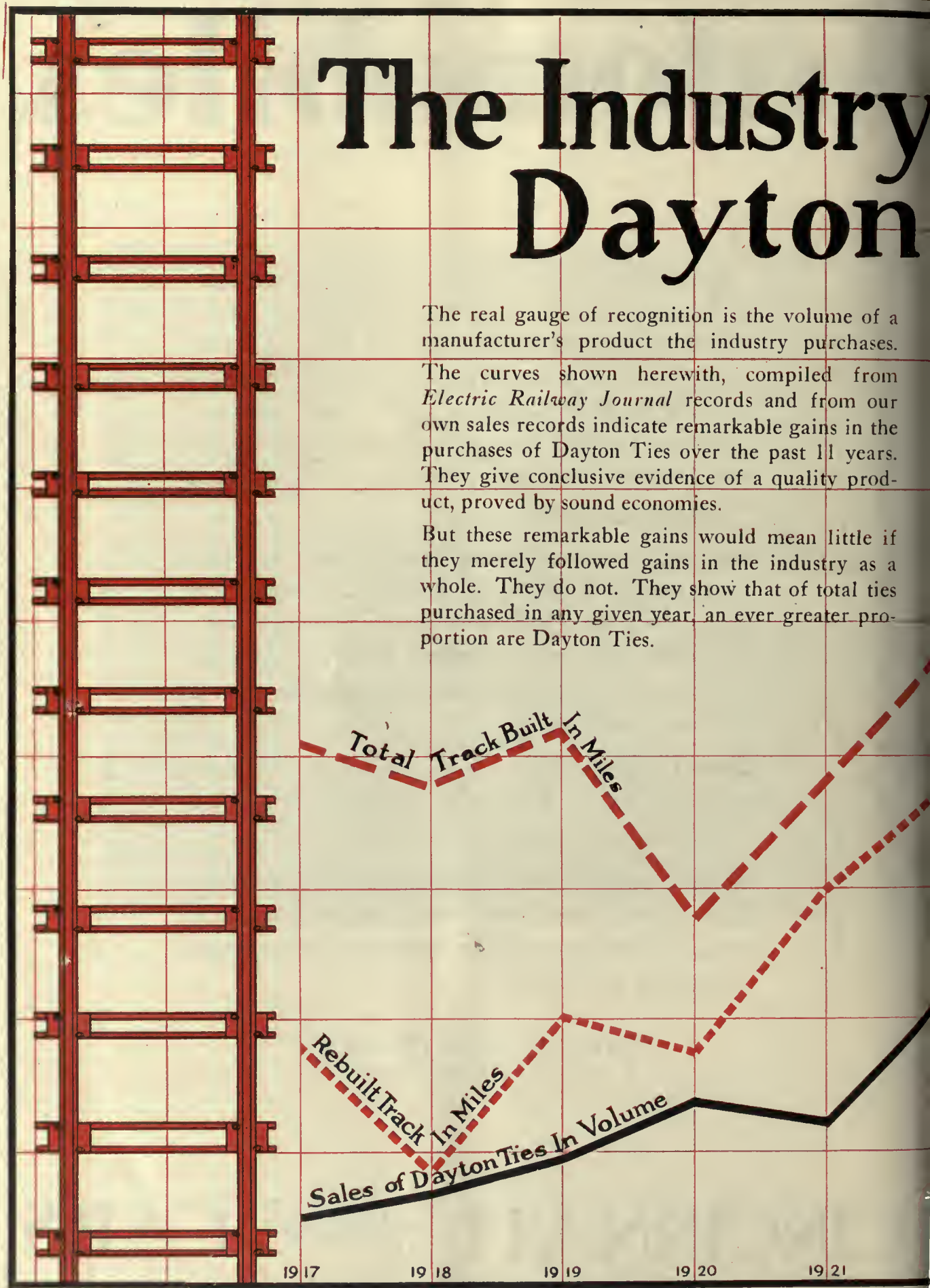
CINCINNATI BALANCED LIGHTWEIGHT CARS

# The Industry
# Dayton

The real gauge of recognition is the volume of a manufacturer's product the industry purchases.

The curves shown herewith, compiled from *Electric Railway Journal* records and from our own sales records indicate remarkable gains in the purchases of Dayton Ties over the past 11 years. They give conclusive evidence of a quality product, proved by sound economies.

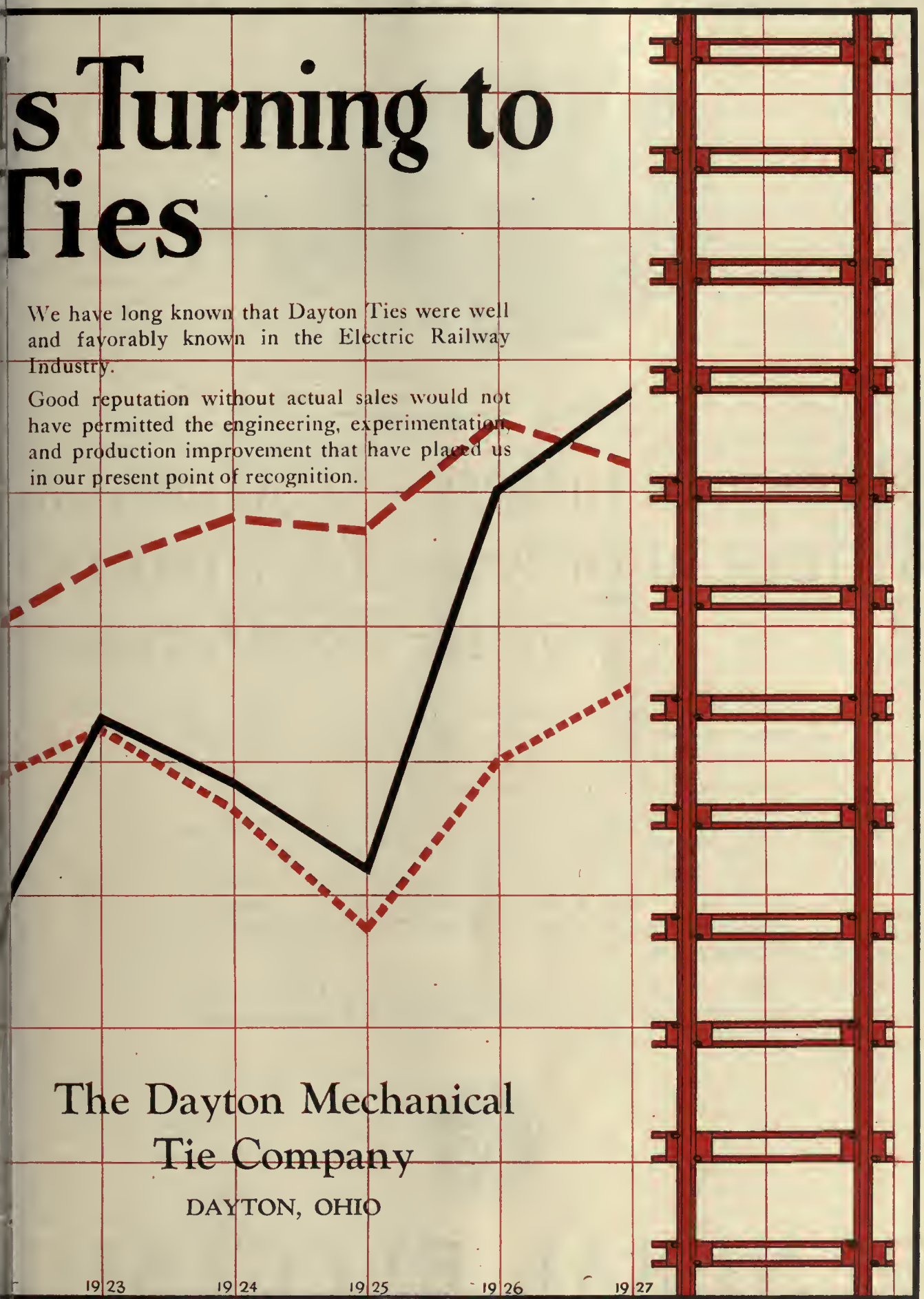
But these remarkable gains would mean little if they merely followed gains in the industry as a whole. They do not. They show that of total ties purchased in any given year, an ever greater proportion are Dayton Ties.



# s Turning to Ties

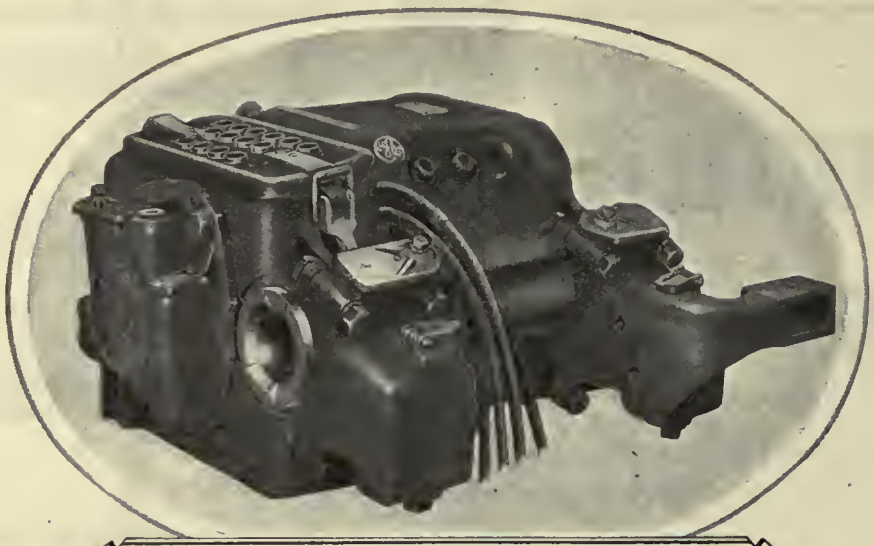
We have long known that Dayton Ties were well and favorably known in the Electric Railway Industry.

Good reputation without actual sales would not have permitted the engineering, experimentation, and production improvement that have placed us in our present point of recognition.




The Dayton Mechanical Tie Company

DAYTON, OHIO



*The GE-265 Railway Motor*

# 81 original orders - 3280 motors
# 89 repeat orders - 4270 motors
# *Total - 7550 motors*

Operators' appreciation of the GE-265 motor is shown by the fact that 81 original purchases involving 3280 motors have prompted 89 additional purchases, bringing the total to 7550 motors.

The City of Detroit, for example, has added seven times to its original 200 motors, until it now has 1764 motors. The Georgia Railway and Power Company has added ten times to the original equipments; and the United Electric Railway of Providence, six.

Such appreciation on the part of these large operators is due to the unsurpassed performance of GE-265 motors.

330-95

**GENERAL ELECTRIC**

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

# Electric Railway Journal

*Consolidation of*
*Street Railway Journal and Electric Railway Review*

McGraw-Hill Publishing Company, Inc.
James H. McGraw, *Chairman of the Board*
Malcolm Muir, *President*
H. C. Parmelee, *Editorial Director*

CHARLES GORDON, *Editor*

Louis F. Stoll,
*Publishing Director*

*Volume 72* New York, Saturday, December 8, 1928 *Number 23*

## Seeing Chicago's Need, but Doing Nothing About It

NEW records for the number of passengers carried and for gross receipts continue to be made by the Chicago Surface Lines. The total number of rides, including revenue, transfer and free passengers, during October exceeded 142,000,000 and was 2,880,000 greater than in March of this year, the previous high month. The gross income rose to $5,475,000. This was $58,000 larger than in December, 1926, when the old record was established.

In 1907 there were 372,000,000 revenue passengers on the surface cars. That was at the rate of 182 for each of the 2,039,000 residents of Chicago at that time. Last year the population had grown to 3,100,000, but the rate of passenger growth was far more rapid than the rate of growth of the population. There were 882,000,000 revenue rides in 1927, or 284 per inhabitant, in contrast to the 182 per inhabitant twenty years ago. This was an increase of 137 per cent in revenue passengers on surface cars. In the same 20-year period the increase in passengers on local elevated lines was 54 per cent.

According to the Chicago *Tribune* the value to Chicago of an improvement in transit facilities is likewise suggested by the report of the New York Transit Commission. In substantiation that paper quotes the fact that in 1906 the use per inhabitant of all local transportation facilities in the five boroughs of Greater New York was 301, contrasted with the Chicago figure of 182 for 1907. By 1923 the rides per inhabitant in New York had increased to 439, but meanwhile subways had been built. The figure for 1927 for the surface and rapid transit lines in New York was 461. As the *Tribune* sees it, these figures point to the probable advantage to be derived from the modernizing of Chicago's transportation facilities and leave many persons wondering why investment bankers are not falling over each other for the opportunity to underwrite the reorganization.

For the benefit of the *Tribune* and the people of Chicago, it should be said that the bankers are not falling over one another to do this because of the policy of bickering and procrastination followed by the city during the past decade. It may be well to recall here that Chicago has, on two different occasions, turned down by popular vote comprehensive plans proposed for the coordination and extension of its transportation facilities—once in 1918 and again in 1925. It is interesting to note also, that those who were so vociferous in opposing previous proposals as being "steals by the bankers and grasping corporations" have been content to lapse into silence while the situation continued to drift and the former franchises to expire. In the meantime these corporations, with inadequate credit and no assurance of future operating rights, have continued to meet with available facilities the public need for transportation service in a way that has established an outstanding record of operating efficiency.

Were it not for the previous failure of Chicago to meet its transportation problem intelligently the situation would not exist as it is in that city today with the Surface Lines operating by grace of grants extended temporarily and with one of the systems in receivership if not in default. A settlement is needed in Chicago, but it can be made only "by close co-operation among the city authorities, the citizens, the railways and the various agencies which create public opinion." The *Tribune* is only partially correct. The opportunity is there. The companies have made the most of it under the limitations imposed upon them. It is a shame that the possibilities in the Western metropolis are not being fully realized, but that shame is Chicago's. So far as transportation is concerned, the slogan of the city appears to have been changed from "I will" to "I won't."

## Approaching the Fare Question on a New Basis

KANSAS CITY has a problem. That has been evident for many months from the earning statements of the recently reorganized Kansas City Public Service Company. Serious decreases in revenue have produced a deficiency in earnings which has for some time been causing grave concern to the railway management. Not only has the company failed by a wide margin to earn the amount allowed in the ordinance, as a return upon the outstanding securities and the $6,600,000 of new money put into the improvement of the property since the reorganization, but it finds itself unable to finance additional improvements demanded by the public, and even threatened with inability to meet its fixed obligations and operating costs.

This is not alone a problem of the railway company. It concerns the city itself, for upon the ability of its public transportation system to maintain a high standard of operating efficiency and to keep up with the growing needs of the community, depends in large measure Kansas City's future development. With that conception of the city's interest in the affairs of its transportation company, the management of the latter has approached the present problem in a laudable way. The railway is convinced that a higher fare is necessary and that nothing less than 10 cents will suffice. But it has made no formal application for an increase. Instead, it has prepared a comprehensive report, clearly presenting the facts of the present situation and outlining the causes of the difficulty and the various alternatives that are open for meeting the situation. This it has submitted to the franchise committee of the Kansas City Council on the assumption that the city has a vital interest in the problem that has arisen, and that any formal move to relieve the difficulty should first be discussed frankly between the company and the representatives of the city which it serves.

In its report, the company openly urges the need for a

10-cent fare. But it discusses in turn, the several other steps that might be proposed and carefully points out the reasons why it considers the higher fare necessary. Throughout the report it is assumed that the city has a vital interest in maintaining its transportation system in a high state of operating efficiency. "No half-starved horse ever pulled a heavy load. A half-starved transportation system never helped the growth, prosperity or credit of a city," says this illuminating document on its first page.

In view of this unusual procedure in approaching the question of street railway fares, it will be interesting to observe the action which will be taken by the City Council. Final supervision of fares is lodged in the Public Service Commission of Missouri, and an examination of the report just made substantiates the fact that the company has ample evidence to support a formal application for a higher fare before the commission. But it prefers to put its problems before the representatives of the city in an effort to avoid the usual proceeding in a rate case. It takes the position that the city should be as much interested as is the company itself in meeting a situation which threatens the efficiency of its transportation service. Will the city recognize the spirit in which this report is thus presented? Will the city officials be willing to face the issue squarely and recognize that preservation of a progressive transportation service is more in the public interest than is the maintenance of the minimum possible rate of fare? That remains to be seen.

## Popularity Enlists Consideration

STREET car patrons are less able than any other class of citizens to pay more than the legitimate cost of their urban transportation. If the street railway industry is to survive and to develop along economically sound lines, it must convince the butcher, the baker, the merchant and the manufacturer, along with city officials and the general public, that a reallocation of taxes and, even more important than that, a changed point of view regarding the taxation of transportation service, are imperative. The merchant, the manufacturer and the property owner are real beneficiaries of urban transportation, although they contribute little patronage directly to the street car or bus. Aside from public officials themselves, city transportation managements represent the only group in the modern community which is in position to speak with knowledge and authority in the interest of the street car or bus rider.

This in effect was the declaration of T. P. Walker, vice-president of the Virginia Electric & Power Company, in an address delivered recently at the annual convention of the Public Utilities Association of Virginia. Mr. Walker emphasized the need for removing unjustified paving and other special taxes imposed upon transportation properties above the usual ad valorem and income taxes assessed against other forms of business. The justice of this plea needs little argument, since it is obvious that these taxes are borne by the car rider for the benefit of property owners, business and auto drivers. The service rendered by a public transportation system is of such value to property, business and the community at large, that the present-day practice of taxing transportation facilities in favor of property and business, might justifiably be reversed, when necessary, to insure maintenance of these facilities which contribute so much in the form of community values.

But to bring about a reversal in the public attitude toward transportation the public must first be made to understand what it might expect in the way of improved transportation service if this important utility were put upon a proper economic basis in relation to the community. This cannot be accomplished by expecting the "pretty good" rolling stock of yesterday to hold its own with the present highly developed private automobile. To win real public co-operation, the possibilities of improved transportation must be demonstrated in any given community, sometimes to the extent of investing good money to show what could be done if proper support were available. The public favors the private automobile today, even in the matter of traffic regulation and parking privileges, despite its relative unimportance in terms of passengers carried. Only by making public transportation popular as well as necessary can its sponsors win that degree of public consideration which its economic importance in the community justifies.

## A Railway Offers to Sponsor and Direct Traffic Planning

DOUBTLESS the Philadelphia Rapid Transit Company would have preferred that some agency other that Mitten Management should conduct a traffic survey of Philadelphia, but when it became apparent that there was little likelihood anything would be done about the matter in the immediate future, the company did not hesitate to indorse the Mitten Management plan for carrying out the work; as outlined in last week's issue of ELECTRIC RAILWAY JOURNAL. All the Philadelphia papers are agreed that a traffic survey is needed in that city. The traffic committee of the Chamber of Commerce has repeatedly urged a comprehensive survey of traffic conditions by an independent expert employed by the city. It was on the score of the inactivity on the part of the city that the Chamber of Commerce acted in approving the Mitten proposal.

After all, the proposal is eminently sound. Who has a broader interest in traffic improvement than the street railway management which is alert to its obligations? The point made in advocating the plan was a strong one —namely, that the management organization had fifteen years of actual experience in furnishing transportation over the city streets and that no group of engineers could come into Philadelphia and secure the facts or acquire the knowledge possessed by the transit management, without long and intensive study.

For years the Philadelphia management has insisted that the rights of the 80 per cent who use the streets for transportation via public vehicles should be respected. It proposes now to get at all the facts regarding street use and traffic movement. The survey is intended to develop a plan for city-wide traffic control, including the operation of all public vehicles; a parking plan; a scientific signal light system; the construction of new streets or the widening of others if found necessary and practical; the elimination of grade crossings; the study of accidents, and every other factor that in any way involves the right of the citizens to obtain the safest and most convenient use of the streets. Surely this is comprehensive. The *Philadelphia Record* has voiced the sentiment of those who have recognized the proposal as sound by stating editorially that no makeshift measures are going to relieve business of the ultimate consequences of traffic overgrowth.

The transit company admits that since it operates the street cars, the buses and the taxicabs, it has a selfish interest to serve, but it points out that its selfish interest is the interest of every man, woman and child who uses its service and that means the great majority of Philadelphia's citizens and taxpayers. It points out, further, that merchants and manufacturers must recognize that the smoother flow of traffic is to their interest, too, even as it is likewise to the interest of the motorists who use the streets.

This is a frank statement of the situation and of the motives of the railway management. Favorable reaction to the Mitten proposal indicates that its very frankness has inspired public confidence. It is promised that only after every interest affected has had an opportunity to be heard will a plan be submitted to the Mayor's traffic committee, and not even then, until after the executive committee of the Chamber of Commerce has approved the recommendations. As the *Record* again so aptly says, whatever the cost of bringing relief to congested Philadelphia streets, it will be less than the cost of letting things drift or of merely tinkering. Either of these courses must ultimately result in enormous losses. It is too bad that this point of view is not more generally accepted. So great is the preponderance of evidence indicating the opportunity for developing an intelligent traffic policy that it is difficult to understand the disposition in many cities to permit business to be choked by traffic that has degenerated into congestion.

## Boston, Revere Beach & Lynn Electrification Merits Attention

PLANNED 56 years ago to develop East Boston and Revere, the Boston, Revere Beach & Lynn Railroad, by the recent electrification of its lines, has taken a long step forward in improving its service to these and other communities. Quicker, more frequent and more reliable transportation is the objective of the present management. Even during the actual installation of electrical equipment schedules were maintained. The demonstrated efficiency of the new electric service is winning friends for this railroad.

Because of the cost of steam operation and minimum crew requirements, large capacity trains formerly were necessary. To load these larger units only infrequent headways could be operated. Therefore, the character of the service suffered. Careful study indicated that electrification of the road would improve transportation facilities and at the same time would lower the cost of operation. With electric power small unit trains are run on shorter headways, giving faster service at decreased cost.

In carrying out the work of electrification an effort was made to keep the total expenditure to a minimum consistent with reliable service and ultimate operating economy. The existing road and equipment was adapted as far as possible to the new motive power. Less than two-thirds of the old cars have been motor equipped, the existing track was altered for electric operation, a feeder-messenger type of catenary overhead was used, and contracts to purchase central station power were made.

The desire for economy in first cost, however, was balanced by a policy of far-sightedness in selecting equipment and materials. Only highest quality apparatus was considered compatible with maximum efficiency. Electro-pneumatic brakes replaced the antiquated vacuum brakes used in the steam operation. This change is considered by the management as a major factor in making possible increased schedule speeds. In the line and catenary installation non-corrosive materials and fittings were used to insure long life and low maintenance. Considering the cost, time and quality of the installation and the unusual conditions encountered and mastered, the electrification of the Boston, Revere Beach & Lynn Railroad stands out as an example of far-sighted and conservative management.

## Agitation for Unification Revived in New York

MOST anything may come out of the medley called transit in New York City. Both the Interborough Rapid Transit Company and the Brooklyn-Manhattan Transit Company, operating the rapid transit lines, are doing the best they can under adverse circumstances, with the various surface lines trailing along. The Equitable Coach matter still is unsettled, that enterprise being in the position of having secured from the city certain rights to operate buses, but not having secured the sanction of the state regulatory authority. The Equitable matter is involved in all sorts of rumors, even to one that its control has passed to interests identified with the present operating companies.

Meanwhile comes the statement that negotiations are to be resumed looking toward unification of the present lines, and the further announcement that the subway lines now being built by the city itself will probably be ready to be placed in service early in 1930. This may be a full municipal enterprise both as to its ownership and its operation in the event that the unification negotiations fail, but even then there would remain the possibility of private operation under a management contract. In any case, the city's system if run as a municipal enterprise must be operated at a 5-cent fare for the first three years, after which a rate must be charged sufficient to make the enterprise self-sustaining.

But the way is not all dark and cloudy. Those entrusted with the prosecution of the municipal enterprise have indicated that there is no intention on the part of the city to build its own power house, and matters have been helped by the disposition of the engineers of the city subway and others to fashion the rolling stock intended for use on the new lines in a manner that will make it possible to interchange service with at least one of the present operating systems, without carrying out major changes in physical structure. There are to be seven connections with existing lines for the interchange of passengers. This also is a good omen since it will help in the event that a plan for unification is devised.

It would, of course, be saying too much to indicate that New York is well taken care of so far as the number of available transit lines is concerned, but it is not saying too much to register the opinion that New York could be much better served than it now is if the existing lines were unified. No amount of ingenuity in the operation of the individual systems can offset the needless waste imposed under a system that does not permit the various systems to articulate their services. The lines now under construction by the city are a legacy from the Hylan administration. It is not too late to overcome some of the defects of their conception, but the value of the new system can best be realized only under an arrangement for co-ordination of operation with the existing roads.

# Express Buses

## to Supplement Rail Service in Houston

**Beeler Organization suggests several methods of providing high-speed service to growing district. Advantages over earlier plans. Functions of buses and electric railway in city transportation are outlined**



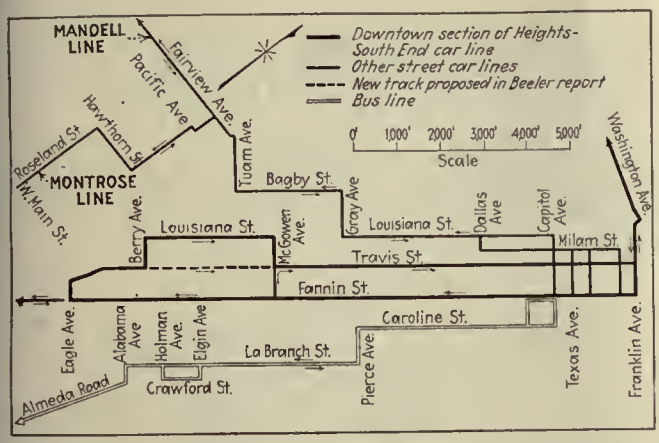
**High buildings being erected in downtown Houston are bringing new problems in local transportation**

TRANSPORTATION problems in Houston, Tex., have recently been the subject of study by the Beeler Organization. This was done at the request of the city, following agitation for the removal of car tracks from certain streets. Rather than the suggested abandonment of car service the Beeler report proposes changes in routing and the establishment of express bus service.

The business district of Houston lies nearly in the geographical center of the city, but the recent rapid growth of the city to the southwest demanded faster service than was supplied by existing means. Main Street, a wide and long boulevard, which passes through the principal shopping district reaches this growing section of the city. Except for two reasons it would form an ideal thoroughfare for a transportation line between the two sections. One is that diagonal parking is permitted, and this has so narrowed its available width for traffic in the downtown section as to leave insufficient room for a line of buses or cars each way, together with such other traffic as naturally would have to be accommodated. Another objection to its use for railway cars is that some time ago a car line was removed from Main Street, and some of the citizens in Houston have acquired the impression that the popularity of the street for retail trade is due in part to the absence of tracks.

The means of transportation in this district at present are shown in an accompanying map, the downtown district being at the right. Main Street is not shown, but lies between Travis Street and Fannin Street. The cars on the Heights-South End car route from the north end of the city which serve this district, come down Washington Avenue, pass through the business district, and then go southwest on Fannin Street as far as Eagle Avenue. Here the line turns northwest for two blocks, and returns via Travis Street, except for a short detour on Louisiana Avenue.

This car line is the most important in Houston. The cars operate on a headway averaging six to seven minutes throughout the middle of the day, four minutes in the morning rush, and five minutes during the evening rush, as far as Eagle Avenue. In addition, eighteen more trips are made during the evening rush hour as far as McGowen Avenue, thereby affording a 2½-minute headway for the section north of McGowen Avenue. During 1927, this line carried 6,953,444 revenue passengers, which is more by 60 per cent than all of the bus lines in the city combined. Persons desiring to travel out Fannin




**Present transportation routing in down-town Houston**

Street beyond Eagle Avenue transfer to a shuttle car at Eagle Avenue.

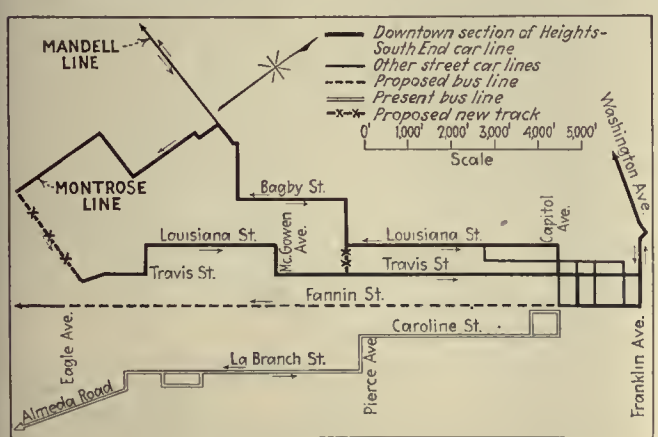
A short time ago the Fannin Street Improvement Committee petitioned the city to order the substitution of buses for electric cars on that street, alleging street railways are now considered obsolete and noisy, that they block traffic, retard the movement of vehicular traffic and are hazardous to pedestrians crossing the street. The abandonment of track on Main Street and its pre-eminence as a business thoroughfare were offered as further arguments for the abandonment of trolley service on Fannin Street.

At the request of the city, the Public Service Commissioner, together with his engineer, suggested some plans for carrying out this request. Plans were also submitted by an engineer for the Fannin Street Improvement Committee. One is illustrated in the second map. By it the Heights-South End cars were to be routed out Louisiana Street around the loop shown and then back to Travis Street, while Fannin Street was to be given up to a bus line. The other plans were slight modifications of this general idea. All involved the abandonment of track on Fannin Street and called for some new track construction to provide the necessary rail connections.

With eight buses, the plan illustrated would require an investment of $126,700 and an increase in total operating costs of $80,488. A second plan also with eight buses called for an investment of $196,975 and increased operating expenses of $81,469. Other plans were prepared calling for 7, 11 and 17 buses. They differed only slightly from that shown.

ESTIMATE OF COST OF BEELER PLAN NO. 1

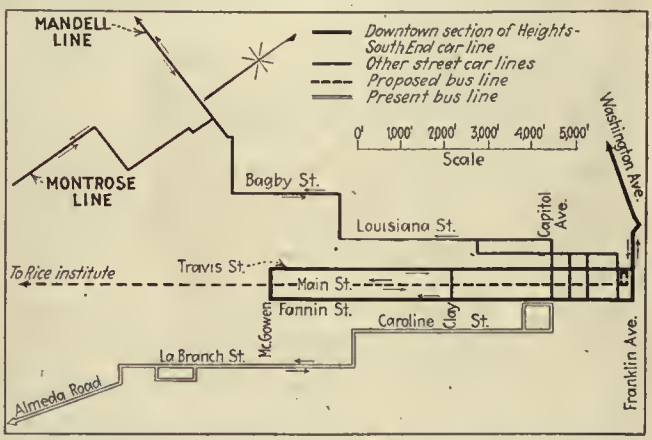
| | | |
|---|---|---|
| Investment: | | |
| Ten buses at $12,000 | $120,000 | |
| Auxiliary equipment at $2,500 per bus | 25,000 | |
| Track on Clay Avenue | 11,250 | |
| | $156,250 | |
| Cost of bus operation: | | |
| 406,063 bus-miles at 16.66 cents | | $67,650 |
| 40,150 bus-hours at 54 cents | | 21,681 |
| 20 per cent renewal and retirements on $120,000 | | 24,000 |
| 5 per cent renewal and retirements on $25,000 | | 1,250 |
| Vehicle tax 10 × $321 | | 3,210 |
| Property tax 2.27 per cent on $145,000 | | 3,292 |
| 8 per cent interest on $145,000 | | 11,600 |
| Total bus costs | | $132,683 |
| Reduction in Car Operating Expense: | | |
| 274,042 car-miles at 14.93 cents | | $40,914 |
| 30,792 car-hours at 54 cents | | 16,628 |
| Tax reduction 2.27 per cent on $97,600 | | 2,216 |
| Total | | $59,758 |
| Less 14.77 per cent on $11,250 for new track on Clay Avenue (8 per cent interest, 4½ per cent renewal and retirement, 2.27 per cent taxes) | | 1,662 |
| Saving in rail costs | | $58,096 |
| Net increased costs | | $74,587 |
| Increased revenue from 2,685,537 passengers using express bus service | | 64,453 |
| Loss in net earnings | | $10,134 |




**One suggested plan was to take up the track in Fannin Street and reroute the cars as shown**

## The Beeler Plan

After being called into consultation by the city, the Beeler Organization suggested three plans. That preferred is shown in the third map. By it the Heights-South End car line would continue to operate on Fannin Street as far as McGowen Avenue, then loop back on Travis Street, and an express bus line would be put on Main Street, to operate non-stop from the business district to McGowen Avenue. Then the buses would run, with stops arranged to permit fast service, to Eagle Avenue and beyond. This plan calls for the removal of the tracks beyond McGowen Avenue, as well as those used by the shuttle car beyond Eagle Avenue, but the shuttle track was to have been abandoned in any event because the cost of new track and paving beyond Eagle Avenue would have been prohibitive. A track connection at Clay Avenue was to be installed for turning short line and emergency cars. The cost of this change is estimated as shown in the accompanying table. The report points out that in this case diagonal parking would have to be given up on Main Street, in favor of parking parallel with the curb, and sufficient curb space would have to be left for bus stops.




**The first choice of the Beeler Organization is to retain most of the track and install an express bus service on Main Street**

The car lines in Houston now operate over 88 miles of track and 59 miles of streets. There are also six local bus lines, three of which reach the business district and three which operate as feeders to car lines. In addition,

TRAFFIC DATA IN HOUSTON, TEX.

| Total in 1927 | | Percent Increase Since 1924 1924 | 1925 | 1926 | 1927 |
|---|---|---|---|---|---|
| 259,000 | population | 100.0 | 109.8 | 120.4 | 132.2 |
| $3,003,365 | passenger revenue | 100.0 | 104.4 | 111.4 | 122.6 |
| 41,264,223 | revenue passengers | 100.0 | 104.9 | 111.0 | 108.6 |
| 35.7 | car- and bus-miles per inhabitant | 100.0 | 95.7 | 91.2 | 90.0 |
| 7.28 | average fare in cents | 100.0 | 99.8 | 100.2 | 112.9 |
| $11.59 | passenger revenue per inhabitant | 100.0 | 95.1 | 92.3 | 92.5 |
| 51,824 | automobile registration | 100.0 | 115.2 | 130.3 | 142.8 |
| 200 | automobiles per 1,000 inhabitants | 100.0 | 105.2 | 108.2 | 108.2 |

there are ten express bus routes. Altogether, the bus routes cover 46 miles of street. The inauguration of express, or non-stop, bus service to serve districts beyond the zone of car or local bus service has met with success and apparently enjoys the unqualified approval of the patrons. The fast express service has been largely a development since 1925. It may have been a factor in checking the rapid growth of the automobile, as automobile registration per 1,000 inhabitants shows no increase in 1927 over 1926.

The tendency in Houston is to serve the district near the center of the city by car and those farther from the center by bus. Of the nineteen car lines radiating from the center of the city, eleven terminate near the 2-mile limit. Only eight go beyond, and of these only one operates any appreciable distance beyond the 4-mile circle. One of the three local bus lines terminates within the 2-mile circle, and the other two extend out about 2½ miles. Of the eight city express bus lines, only one terminates at a distance less than 3 miles out and three operate beyond the 4-mile circle.

The present rates of fare, effective June 12, 1927, are as follows:

On street cars and local bus lines, 10 cents cash with four tokens for 30 cents; the purchase of a 25-cent weekly pass enables the holder to ride on any local line for 5 cents each time; children and students may ride for 4 cents cash.

On express bus lines the fares are: 10 cents straight; children and students for 5 cents; free transfers connecting from express bus lines to all other lines. Passengers may receive transfers from local to express bus lines on payment of a 10-cent cash fare, or the payment of 2 cents in addition to any token, or a nickel cash fare. The charge for a transfer to children is 1 cent.

In 1928 the express buses will carry, in round figures, four million riders. These buses now average 2.7 passengers per bus-mile. As the total cost of this service, including interest on the investment, is 30 cents per bus-mile, it will be seen that the cost per passenger is 11 cents. In other words, the service is being conducted at present at a loss of 10 per cent. However, the territory served is newly developed and this handicap of a 1 cent loss per revenue passenger should speedily be overcome. An advantage of the express bus service is that it satisfactorily solves the rapid transit problem for years to come in an efficient and economical manner.

## Bus Progress in China

BUS operation is making progress in China, though somewhat slowly, according to a foreign contemporary. The principal reason is the lack of good roads. Nevertheless, where fairly good roads exist, the automobile and bus are found in growing numbers. At the end of 1926, there were 26 omnibus companies in China, mostly in the northern part.

The first bus company in Shanghai was established in 1924 with a capital of about $500,000 and with buses purchased in England. Operation was begun on the basis of a fairly high fare and a seat for every passenger. But little business was done, however, until the fare was put down to about 1¼ cents per mile, and a standing load was carried. Then the company began to make money. The buses now owned number 52, and the routes operated vary from 2 to 7½ miles in length. The company employees about 450 men.

# Shreveport Railway Pushes Ahead

### By purchasing new equipment the company has overcome jitney competition and has increased its earnings and income

SHREVEPORT, La., has 80,000 inhabitants and the Shreveport Railways furnishes transportation there with 35 miles of track and 52 passenger cars. The company has overcome both jitney competition and the handicap of an inadequate fare, and during 1927 both its earnings and income were higher than in any twelve months period during the past five years. It tells its story modestly but clearly in its Coffin award brief prepared for the 1928 contest.

When the company first sought a higher fare in 1920 the increase was granted promptly by popular vote. Unfortunately for the company, a change in the state constitution made soon after required ratification of any fare change by a state commission and this was not granted. Finally, by appeal to the United States courts, an increase in fare from 5 to 7 cents was obtained, and was accepted without complaint by the citizens of Shreveport. Jitney competition was met by a steady policy of fair dealing and full publicity of the problems of the company through the newspapers and other available media.

During the past year the Shreveport Railways installed three 500-kw. automatic substations, which, with one already built, have permitted it to abandon its power station in favor of purchased power. The estimated saving in money is $500 per month. During the past year also it has built a new paint shop 200x30 ft. and installed a system of spray painting. By its means, one painter and helper do as much as was formerly accomplished by two painters and two helpers. The company has also purchased during the year two 52-passenger cars, equipped with treadle doors and suitable for one-man or two-man operation.

Its safety campaign is based on the plan adopted in 1924, by which any motorman or conductor who is in continuous service and for a period of a year has no accident, receives a gold star. Two such stars entitle the motorman, and three stars a conductor, to a new uniform. A new uniform is also given for each succeeding year of similar service. Under this arrangement during 1927, out of a total of 133 motormen and conductors, 100 earned a star, and 34 motormen and 31 conductors earned a uniform.

The amount of money paid by the company during 1927 for damages, including in this payment cost of the new uniforms given to the motormen and conductors, for yearly no-accident records, was $5,999. This is less than 1 per cent of the gross revenue.



Catenary type overhead with feeder-messenger is suspended from steel bridges

# "Narrow Gage" Electrified

## for Economy

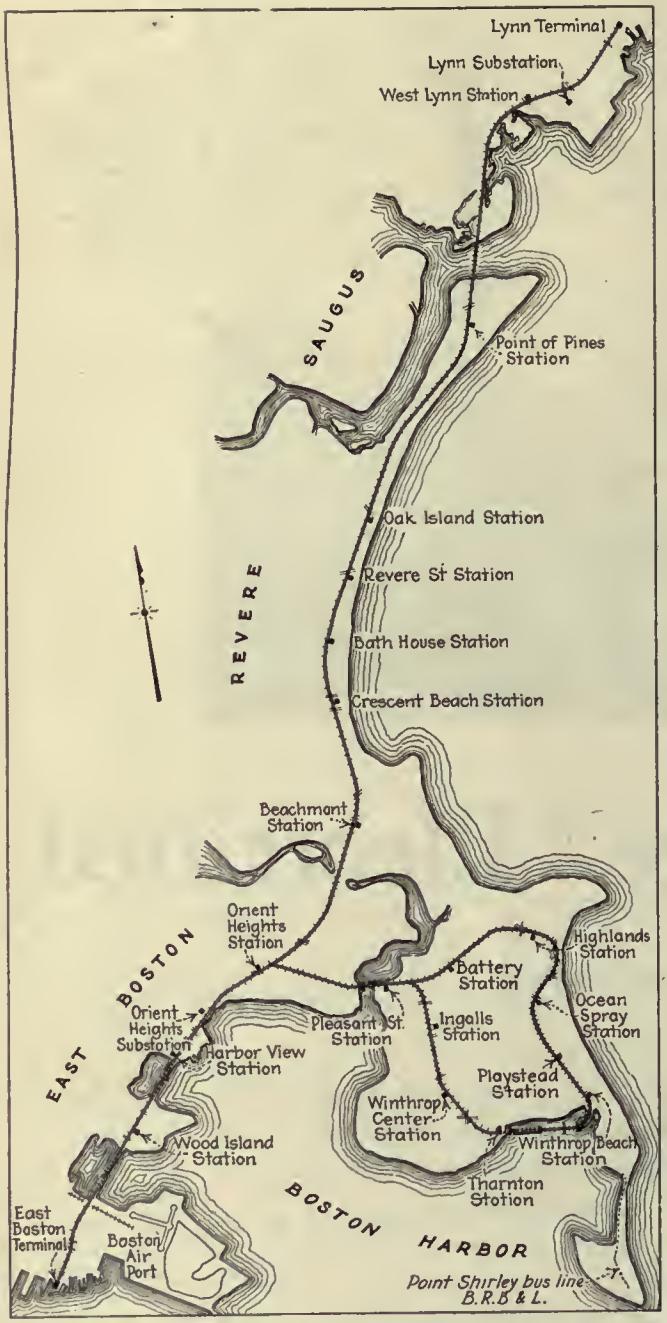
**Quicker, quieter and cleaner service now being given by Boston, Revere Beach & Lynn Railroad. Three-foot gage retained. Special motor constructed. Messenger feeder used in catenary type overhead**

ECONOMY was the paramount consideration in the electrification of the Boston, Revere Beach & Lynn Railroad, Boston, Mass. At the same time the service has been made quicker, quieter and cleaner. As the electric trains move smoothly over the line, murmurs of satisfaction are heard from the passengers on every hand. To make possible this improvement in service, an expenditure of $1,400,000 was required which was divided in the following manner:

| | |
|---|---|
| Car equipment | $610,000 |
| Substations | 152,000 |
| Overhead structures, lines and feeders | 277,000 |
| Signal changes | 90,000 |
| Miscellaneous construction including engineering, interest charges, etc. | 271,000 |

During rush hours, six-car units and express trains have been inaugurated. Throughout the day trains operate at an increased schedule speed and greatly decreased headway. The running time between Boston and Lynn has been reduced about one-third and the comfort and safety of passengers has been materially improved. At the same time, the number of cars in operation has been reduced from 96 to 67 and the 26 steam locomotives have been discarded. The essential principles of steam and electric operation are fundamentally opposite. In steam operation, on account of the cost of locomotives and minimum crews, the whole tendency is toward heavier trains and greater headway. In passenger transportation, shorter headways mean more passengers. With electric operation the trains can be broken up into smaller units running on shorter headways, thus giving faster service with less expense.

The Boston, Revere Beach & Lynn Railroad was planned 56 years ago, primarily to develop the land which now comprises the municipalities of East Boston and Revere. Service was inaugurated in 1875. What is now the Winthrop branch was originally the Boston, Winthrop & Shore Railroad, started in 1877, and merged with the Revere Beach Road in 1891. In November, 1927, the railroad was purchased by the Eastern Railway




**The Boston, Revere Beach & Lynn Railroad electrified its entire system from the East Boston terminal, which is connected to Boston by ferries, to Lynn including the double-track loop to Winthrop. Substations are located at Orient Heights and Lynn**

Associates, controlled by Hemphill & Wells, and American Equities Company.

Immediately upon acquisition of the property by the new owners, steps were taken toward electrification. There was an outstanding capital stock of $850,000 and 4¾ per cent first mortgage bonds amounting to $1,000,000. To finance the electrical program, the Massachusetts Department of Public Utilities authorized an issue of additional capital stock in the amount of 1,700 shares with a par value of $170,000 and $1,000,000 in 6 per cent, general mortgage bonds. Additional short-term notes were necessary to complete the financing.

As shown in the accompanying map the railway operates between Boston and Lynn with a branch line forming a loop through Winthrop. To connect Boston with the terminal in East Boston, three ferries are operated across

### Car Equipment

| | |
|---|---|
| Trucks | Brill 177-E2 |
| Motors | General Electric 295-A, 600-volt |
| Trolley | Nuttal. Trolley wheel No. 48. Harp—Form 30 |
| Trolley base | U. S. 14 |
| Main switch | MS-118-A |
| Fuse box | MA-13-F |
| Contactor box | SB-72-A3 |
| Master controllers | C-503-A |
| Reverser | DB-431-A1B |
| Field control switch | ME-67-C1 |
| Grid resistors | Type BG-Form G |
| Heaters | Consolidated Truss Plank |
| Lighting fixtures | Electric Service Supplies Company, 1022 Dome Type |

### Electro-Pneumatic Brake Equipment on Motor Cars

| | |
|---|---|
| Master governor | ML Form E3 |
| Contactor (compressor switch) | DB 937 |
| Feed valve | M3 |
| Motorman valves | A-Form D14, modified to omit release pipe and to include the contactor pipe connection |
| Equalizing reservoirs | Two 10x14½ in. |
| Contactors | duplex pneumatic |
| Brake cylinder | Type S 12x12 in. |
| Triple valve | M2A |
| Supplementary reservoir | 16x42 in. |
| Conductor's valve | B3A |
| Slack adjuster | Form J |

the harbor. The entire system is double track. Last year 13,350,000 passengers were carried. A total of 60 electric cars, seven trailer cars, and two electric service cars are operated over 13.12 miles of line having 34.48 miles of electrified track. The running time between Boston and Lynn has been reduced about ten or fifteen minutes, which is a saving of one-third of the time formerly required by the steam trains.

No new cars have been purchased. Sixty of the 96 passenger cars used in steam service have been remodeled and electrically equipped. Seven additional cars have been remodeled as trailers. The interior of each car has been refinished and small operating cabs built in each end. Each car has been equipped with 30 Consolidated 500-watt truss plank heaters connected fifteen in series on a circuit. The heating circuits are controlled by a Consolidated No. 213 switch mounted at the motor end of the car. Wiring has been installed for a thermostat to be placed in the center of the car. The lighting fixtures furnished by the Electric Service Supplies Company are the 1022 dome type, with short-circuiting sockets. Twenty of these dome fixtures with 32-volt lamps are connected in series in each car. A General Electric J-63 headlight can be attached to the front of each car by means of brackets arranged on the handrail. These headlights are equipped with 250-watt incandescent lamps controlled by a three-way switch located in the cab through a tapped resistance permitting dimming.

Motive power has been provided by replacing one of the old trucks with a new Brill 177-E2 truck equipped with two General Electric 295-A 600-volt railway motors. Because of the narrow gage these motors were especially designed for this installation. They are the four-pole, direct current, commutating pole railway motors for operation with tapped field on 600 volts. The weight of the motor complete with gear, pinion, gear cover, and axle bearing linings, is approximately 2,770 lb.

The frame of the motor is the box type with bar suspension. Longitudinal ventilating ducts are provided in the armature, which is keyed to the spider. The shaft can be replaced without disturbing windings or the commutator. The commutator is unusually narrow for a railway motor and its diameter is 14½ in. The depth of

the segments is approximately $\frac{3}{4}$ in., the segments being mica-insulated and grooved $\frac{3}{64}$ in. There are four brush-holders per motor, which are adjustable radially. Steel clock spring pressure fingers are centrally located by recessed adjusting sleeves which are clamped by the first turn of the spring. The carbon ways are renewable and each brush-holder is equipped with a $1\frac{3}{4}$-in.x$\frac{5}{8}$-in. brush. Because of lack of space, the commutator overrides the bearing on that end of the motor. Ventilation is produced by a multiple fan integral with the pinion end



Because of the 36-in. gage the motors were specially designed by the General Electric Company

of the armature head. The air intake is through protected openings in the top of the commutator cover.

The cars are equipped with type M control for multiple-unit operation. Current is collected from the trolley by a Nuttal 11 ft. 4 in. pole. Current is carried down the car at the left-hand corner post on the motor end, to a main switch and a fuse box located underneath the car. This, in turn, is connected to a contactor box which is operated by a C-503-A master-controller located in the cab at each end of the car. A type ML form E-3 master governor is mounted under a longitudinal seat in the front end of the car and connected to a snap switch in the operator's cab.

Cables from the connection boxes mounted under the cars are carried up through the car framing to the roof and all electrical connections between cars are made overhead by means of coupler sockets located in the ends of the car roof. A No. 00 bus line runs from end to end of each car, connecting the trolleys and DA-35G bus line coupler sockets, located in the ends of the cars. With the exception of the heater circuits, no metal conduit is



A two-motor Brill truck is provided for on each car



All electrical connections between cars are made by means of coupler sockets located in the ends of the car roofs

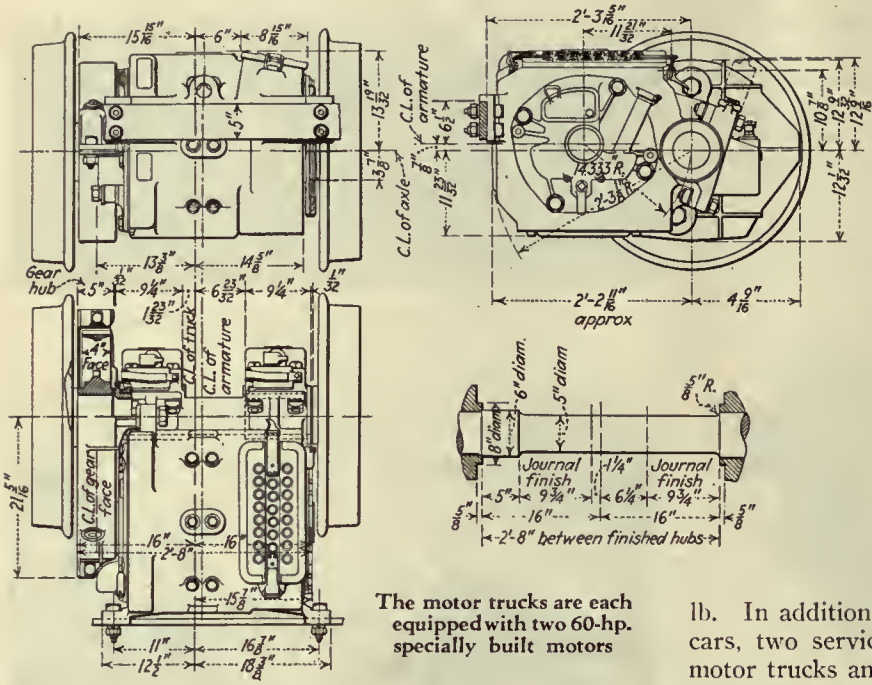
used in these cars. The control cables were grouped, taped and covered with a weather-resisting mulehide. The lighting circuits were run in wood moldings on the interior of the car mounted in the cove of the ceiling. The advertising signs are snapped in place over this molding, completely concealing it.

General Electric electro-pneumatic brakes are installed on each car. This equipment uses a brake valve, having an equalizing piston which functions to give a pneumatic service application if, for any reason, the electric brake is inoperative. There are five positions on the brake valve from left to right as follows: release, holding, lap, service, and emergency. In conjunction with this brake





At left, the old cars before electrification. At right, the same type of car refinished and electrified



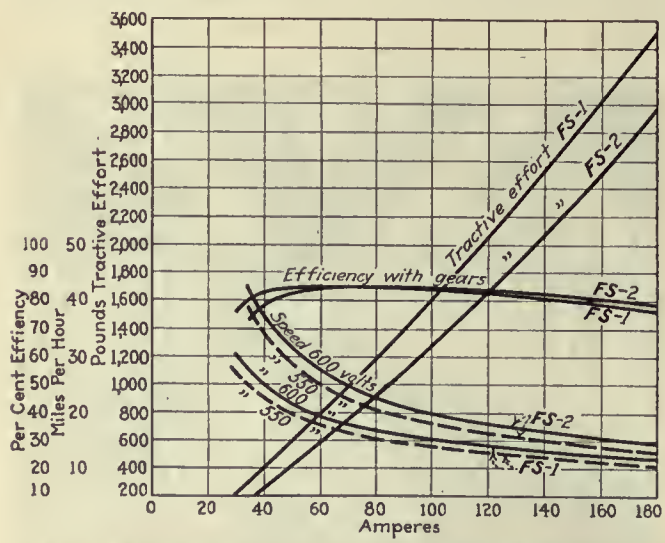

The motor trucks are each equipped with two 60-hp. specially built motors

valve is used a pneumatic duplex contactor. In release position of the brake valve the contactor is in neutral position. In holding position it is moved to the right and energizes the holding magnet. In lap, it is again in neutral position and in service or emergency position it is moved to the left and energizes the application magnet, causing the brake pipe reduction to take place at the application valve in service position, and at both the brake valve and application valve in emergency position.

In electric operation of the brakes, a service application is made in the regular way, and after the proper brake pipe reduction is made, the handle is returned to the holding position. In this position of the brake valve handle, the triple valve goes to release position, but the release or holding wire is energized by the contactor which, in turn, energizes the holding magnet and retains in the brake cylinder any air that has been admitted. The brake may then be graduated off by moving the brake valve handle between the holding and release position. The graduating actually being accomplished by energizing and de-energizing the holding magnet, which in turn seats and unseats the release valve in the magnet bracket.

In making an electric service application, the equalizing piston does not move as brake pipe air is being taken from the under side of the piston, past the application magnet valve, as rapidly as the equalizing reservoir air is being taken from the top of the piston. In making a pneumatic service application, no brake pipe air is taken from the underside of the equalizing piston, while equalizing reservoir air is depleting to atmosphere and consequently the higher brake pipe pressure raises the equalizing system, allowing the brake pipe air to escape to atmosphere at the brake valve. Brill brake rods and brake beams are used.

The cars, completely electrically equipped, weigh approximately 52,000 lb. In addition to the 60 electric cars and seven trailer cars, two service cars were equipped with two double motor trucks and using the type K-35-JJ control.




Characteristic curves of the motor operating with a gear reduction of 3.77 and 30 in. wheels. FS-1, full field and FS-2, tapped field

Power is furnished through two substations, one located at Orient Heights and the other at Lynn. The Orient Heights station is supplied by the Edison Electric Illuminating Company and the Lynn station by the Lynn Gas & Electric Company. The Orient Heights station furnishes power to all lines. The two 600-volt trolley wires from this station to East Boston are furnished with power by this station only, when under normal operation. The two trolleys from the Orient Heights station to Lynn are furnished power by both stations. The two trolleys on each of these sections are bonded about every ½ mile. The Winthrop loop is furnished power by the Orient Heights station and each trolley wire is completely insulated from the other. Any section of the line may be supplied by either station or a portable station. A 2,300-volt line parallels the track furnishing power to the signal system and other power apparatus.

The substation at Orient Heights is of the automatic type and contains two synchronous railway converter sets, of 650-volt, 1,000-kw. capacity. This station has four d.c. stub multiple-feed reclosing feeders, 650 volts, 2,000 amp., and one d.c. stub feed reclosing feeder 650 volt, 2,000 amp.

The two a.c. 13,800-volt incoming lines are provided with manually operated breakers which are tripped only on reverse current overload, indicating a line fault or a severe overload on the 13,800-volt bus or transformers.

An unusual feature in this substation is the system of ventilation. A steel housing is constructed over each machine, similar in shape to a blower housing. The rotation of the converter causes a draft of air to flow through this housing into a cavity in the floor. The air passes from this to a funnel leading to the ceiling. The warm air from the converter freely rises through the funnel and is expelled through the roof. A damper regulates the degree of temperature maintained. These housings are built in sections and bolted together so that they can be dismantled easily without disturbing the machine. The framework is built up of angles and covered with No. 8 sheet steel. The stack is covered with No. 18 sheet steel.

The substation at Lynn consists of a 1,000-kw., 650-volt converter set which is housed in the power house of the Lynn Gas & Electric Company. This substation is

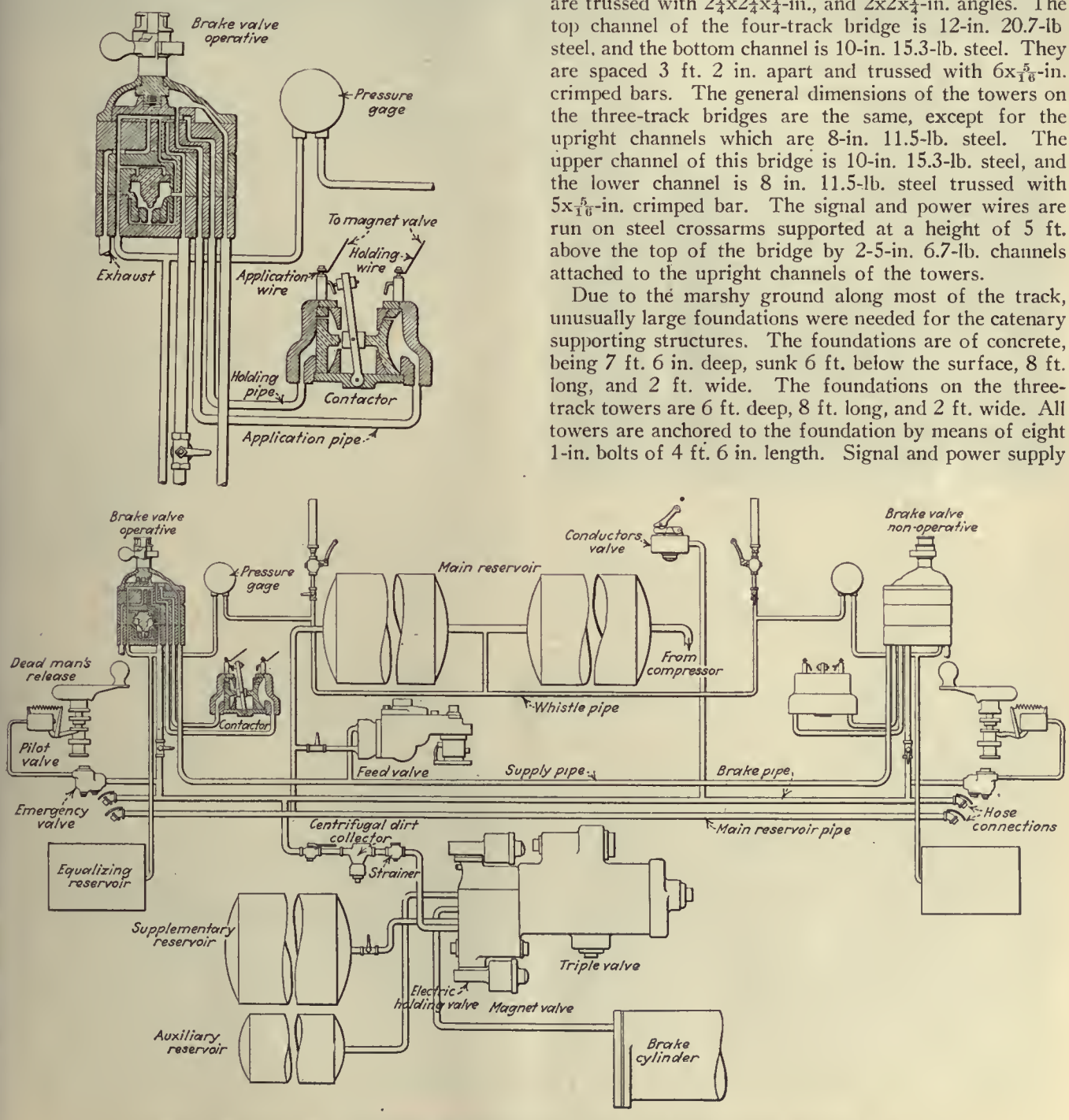
arranged for manual operation only, and is operated by the electric company's forces at a fixed charge.

A portable substation is arranged to be connected to the line at either Orient Heights or the Lynn substation, as the 13,800 feed is available at these points. This substation consists of a 1,000-kw. unit of the manually operated type mounted in a cab on a steel car. The transformer and oil circuit breakers are mounted on the car outside of the cab, making it a complete portable unit. The estimated power consumption per year for the line is about 10,000,000 kw.-hr. The Lynn Gas & Electric Company will furnish 2,500,000 kw.-hr. of this and 7,500,000 kw.-hr. will come from the Edison Electric Illuminating Company.

The line installation presents a number of unusual features. The actual construction work performed under many handicaps and in record time without seriously interfering with the normal flow of traffic. Throughout the day trains operated on a fifteen-minute schedule, and during the morning and evening rush hours, work was interrupted by passing trains every ten minutes. For this reason, a large part of the construction program was carried on at night. Between the hours of midnight and 6 a.m. the trains operate on an hourly schedule, thus permitting the delivery of materials and equipment by a special night work train.

The catenary supporting structure consists of 262 corrosion-proof steel bridges, spaced at a maximum distance of 300 ft. The towers of the four-track bridges consist of 10 in. channel, 15.3 lb., tapering from 6 ft. centers at the base to the center of the top bridge channel at a height of 22 ft. 6½ in. above the rail. The towers are trussed with 2¼x2¼x¼-in., and 2x2x¼-in. angles. The top channel of the four-track bridge is 12-in. 20.7-lb steel, and the bottom channel is 10-in. 15.3-lb. steel. They are spaced 3 ft. 2 in. apart and trussed with 6x$\frac{5}{16}$-in. crimped bars. The general dimensions of the towers on the three-track bridges are the same, except for the upright channels which are 8-in. 11.5-lb. steel. The upper channel of this bridge is 10-in. 15.3-lb. steel, and the lower channel is 8 in. 11.5-lb. steel trussed with 5x$\frac{5}{16}$-in. crimped bar. The signal and power wires are run on steel crossarms supported at a height of 5 ft. above the top of the bridge by 2-5-in. 6.7-lb. channels attached to the upright channels of the towers.

Due to the marshy ground along most of the track, unusually large foundations were needed for the catenary supporting structures. The foundations are of concrete, being 7 ft. 6 in. deep, sunk 6 ft. below the surface, 8 ft. long, and 2 ft. wide. The foundations on the three-track towers are 6 ft. deep, 8 ft. long, and 2 ft. wide. All towers are anchored to the foundation by means of eight 1-in. bolts of 4 ft. 6 in. length. Signal and power supply




**In conjunction with the brake valve of the electro-magnetic brakes a pneumatic duplex contactor is used which energizes the holding or application magnets**



**The Orient Heights substation houses two automatically controlled 1,000-kw. synchronous converters. Note the exhaust ventilators in the roof**



**This portable substation may be connected to feed any section of the line**

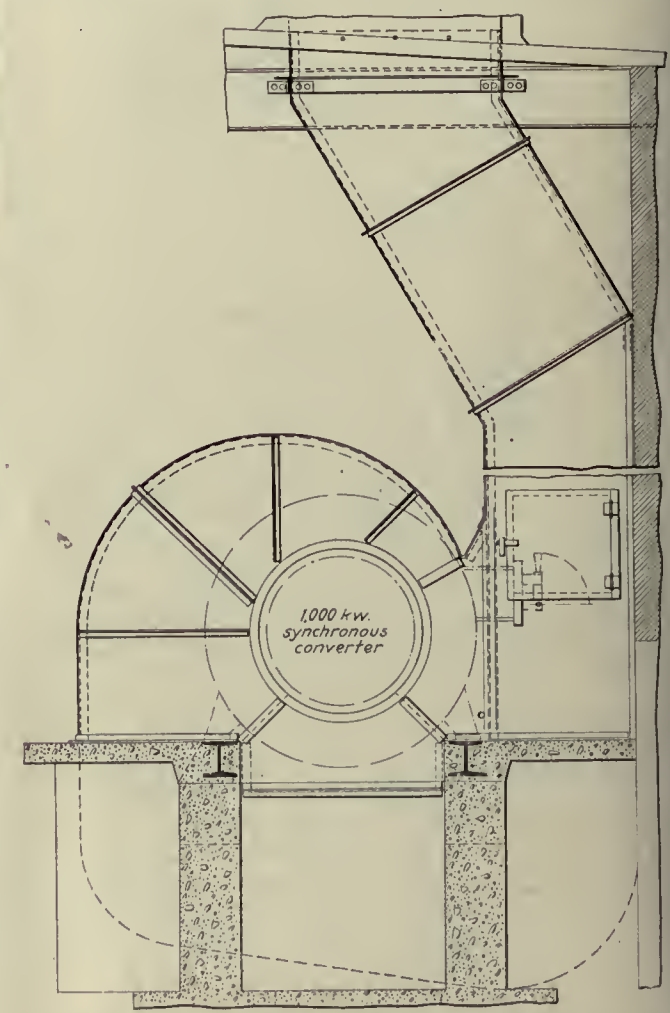
wires are carried on crossarms supported at a height of 5 ft. above the top of the bridge by two 5-in. 6.7-lb. channels attached to the upright channels of the tower.

To hold the trolley wire over the track on curves, steel pull-off poles were installed. These were set on concrete foundations at an angle, and laterally braced, no backbracing being used. In all, 161 of these poles were used ranging in height from 18 ft. to 23 ft. 6 in.

For the reason that the required feeder cable had sufficient strength to support the No. 0000 grooved trolley wire, a 500,000 c.m. copper cable was used as both messenger and feeder for the entire system. Hitenso trolley wire was used, consisting of 99½ per cent bronze and ½ per cent cadmium. The messenger and trolley wire are bonded about every 600 ft. All hangers and castings are of non-ferrous material.

In the yards and siding, the overhead is direct suspension type. To prevent corrosion, all span wires are of red brass. No copper ground return is used on the system, the track being depended upon for the return. This is possible because all of the tracks are on a private right-of-way and there are few paralleling pipe lines to cause electrolysis.

The insulators supporting the messenger are G-E No. 294698, consisting of General Electric metal parts cemented to Locke insulators. The insulators supporting the short feeders running from the Orient Heights substation to the Winthrop branch lines are supported on this same type of insulator. The span wire insulators are Locke guy strain insulators No. 7664. The 2,300-volt signal and power supply line is carried on Locke 8,000-volt pin-type insulators No. 12. Due to the large number of overhead highway bridges crossing the track, about ½ mile of wood troughs for the trolley wire had to be installed.




**A housing is built over each rotary converter in the Orient Heights substation, making possible proper control of ventilation and temperature**




The prepayment system using turnstiles was installed in the stations. Exit turnstiles were placed outside the station



Automatic block-color light signals were installed

No more alterations than necessary were made to the track. The rails, which are 4¼-in. 60-lb., A.S.C.E. type were bonded with GE.H-3, No. 0000, 7½-in. bonds, acetylene welded. The curves were graded for speeds of from 35 to 40 m.p.h. Under the bridges, where additional clearance was needed, the tracks were lowered.

The signal equipment furnished by the Union Switch & Signal Company, included the installation of automatic block-color light signals operated from the 2,300-volt line through type H, 60-cycle, ¾-kva. transformers.

The prepayment system is installed in all of the principal stations using General Electric turnstiles. Prepayment areas were fenced off around the station and before the electrification of the lines was completed, motor-generator sets were installed at each station to operate the new turnstiles. In the Boston station, which is across the harbor from the rest of the line, only 250-volt d.c. current is available. Therefore, two 5-hp. motor generator sets delivering 600-volt current to the turnstiles are used.

The actual construction of the electrification was started on April 2, and is now complete in every detail. The entire construction, installation, which was done under the supervision of Hemphill & Wells, New York City, was completed in seven months almost to a day.



The yard at the east Boston Terminals where the ferries connect with the trains

# Cars and Buses Dispatched by Telephone

**A number of advantages follow the use of the telephone for dispatching in city service, as employed in San Antonio, Tex.**

IN THE issue of Nov. 3, a brief reference was made to the practice in San Antonio, Tex., of dispatching cars and buses by telephone. This is an important feature of car and bus operation in that city. In fact the whole plan of service, according to the company's Coffin prize brief this year, is built around the company's telephone dispatching system. Particulars were given in these pages several years ago, but so much stress is laid by the company in its brief on the advantages of the plan that a more extended account will be published.

The dispatcher's office is located in the main office building near the superintendent of transportation, chief dispatcher, claim department and other offices. One P.B.X. board here is provided with direct connections to telephone stations at the end of each car and bus line, at main points along the route and at points of advantage downtown. This furnishes a network of direct channels of communication from the dispatcher's office to the train crews and to the supervisors on the entire system.

Train crews and bus operators are required to report to the dispatcher whenever they reach either end of each line. The dispatcher then makes a daily record of all such arrivals, so that he has a complete record of all car and bus operations on his "dispatcher's train sheet." On this sheet he shows the exact time that each car or bus reports at the ends of their respective lines throughout the day, as well as the time they are scheduled to be there. In case a car or bus is cut back short of the end of its route, the point on the line that the car was cut back is shown on the train sheet. Line set-backs, extra service, car changes, etc., are also recorded on this sheet, so that at the end of a day it shows not only the scheduled operation as planned, but the actual operation as to car spacing, delayed cars, extra service used, car failures and the effects of any interruption to service.

All dispatching orders are written, whenever possible. Owing to the nature of the business done, however, as the cars are in city service and the buses are not confined to a track, the dispatching procedure followed does not have to be as rigid as on a steam railroad or interurban line. Trainmen are encouraged to think for themselves and use their judgment in case of an emergency, even turning back, if necessary, though if this is done they are expected to notify the dispatcher of their action as soon as possible.

A necessary change in the service can be ordered by an inspector in emergencies, or he can request telephone authority for such a change from the dispatcher, who has authority to order the change first and then write the confirming order.

### Telephone Has Other Uses as Well

The telephone system is not used exclusively for dispatching. All reports and all messages from the supervisor and trainmen regarding daily operation, such as car trouble, track and overhead trouble, accidents and blockades, come to the telephone dispatcher, who notifies the proper department. When doing so he gives the location and nature of the trouble and follows up this message with a written order. The dispatcher also keeps in contact with the tower wagons and track crews which are out working on the line, so that in case of trouble he can get in touch with them immediately.

As already explained, it is a rule that messages and orders regarding service or changes in service, or any message pertaining to the operation of cars, must go through the telephone dispatcher's office. In other words, the dispatcher's office acts as a message center and headquarters of operation.

The dispatching system also plays a large part in the system of checking up on what each man is doing. The fact that each trainman calls up at the end of the line not only serves as a check on his operation, but it encourages him to make every effort to reach his terminus and telephone in on time. Trainmen's times are also checked by road supervisors from time to time at different points along the line.

### Advantages of Telephone Dispatching

The company lists eleven advantages of the company's system of telephone dispatching. Briefly, they are as follows:

1. The fact that each operator or motorman comes in direct contact with the main office once each trip stimulates his desire to run his car on time.

2. The system is popular with the trainmen because each knows that the man ahead of him cannot leave the end of the line ahead of time and so require him to carry an overload.

3. Knowledge of conditions permits the dispatcher to anticipate delays in time to prevent them. Thus, if a car is late, the dispatcher can get in touch with an inspector, who will help the operator get his car back on time before it gets completely out of schedule. Mechanical troubles with cars are reported by trainmen while they are calling in to the dispatcher. These troubles can then be fixed before they cause a delay. The same is true of track conditions and broken span wires.

4. Quick communication gives prompt knowledge of delays. Supervisors do not have to wait until they discover an exceptionally late car to surmise that there is trouble.

5. The means at hand permit quick rectification. The inspector can quickly summon car wagons, track crews, inspectors or an emergency trouble car and can order cars out of the barn to fill open spaces immediately.

6. The plan allows higher speed, because very little allowance need be made for delays, since the dispatcher can anticipate the delay in service or immediately install service after the delay. It is believed that over-all schedule speed, at least 10 per cent faster than would otherwise be possible, may be obtained by the use of telephone dispatching.

7. The system relieves lines inspectors of a great deal of their routine work of schedule supervision and permits a smaller number who can devote a greater amount of their time to instruction work and giving special attention to any men who are having difficulty.

8. Constant contact with the inspectors permits the dispatcher to get in touch with several of them more promptly to handle critical situations, and in emergencies concentrates them where they can do the most good.

9. Emergency crews may be kept constantly in production work yet be available for emergencies. The company believes that the saving in this factor alone more than pays for the entire cost of operation of the dispatching system.

10. Reports of accidents are transmitted immediately to the claim department because the train dispatcher can connect the trainmen directly with that department. This gives the claim department the advantage of immediate information.

11. The dispatcher's train sheet gives a complete record of the operation, both as to the movement of cars and of trouble.

Study of these train sheets on the causes of delay have been the means of greatly reducing the number and time of delays, as well as the number of late cars.

# How Vienna Tramways

# Handled the Schubert Festival

**Transportation of an extra 100,000 persons to concert hall proved easier than moving a smaller football crowd. A review of Vienna's present facilities and traffic is included**

*By Walter Jackson*
Fare and Bus Consultant




Standard motor car for surface lines in Vienna

ONE OF the mightiest musical gatherings of modern times occurred at Vienna during July, 1928. It was held to honor the centenary of Franz Schubert, who died 100 years ago at the early age of 31 years with a most astounding number of famous compositions to his credit. German singing societies came from all over the world to his native city for the event.

The concerts were given in a temporary hall holding 80,000 people. This hall was built on a meadow in the famous "Prater." This is a great chain of public parks, including a host of amusements, similar to those at Coney Island. The site was a fortunate one for the Vienna Municipal Tramways, which had provided station and storage facilities here in past years for handling amusement crowds. The storage capacity of the main terminal alone, known as the Hauptallee, was equivalent to 48,000 passengers.

The estimated number of visitors to the city was from 150,000 to 200,000, including 34,000 to 40,000 singers! During the peak of the festivities July 19-22, more than 100,000 persons had to be transported to and from the "Saengerhalle." To prevent interference with free car movement on the Hauptallee line, an underpass was constructed for pedestrians, and all cross travel over the tracks was forbidden by the police. The station was lengthened to 750 m. (2,445 ft.). As a result, it was possible to handle 120 three-car trains each way in an hour. Most of Vienna's cars seat only 24, but the regulations permit a maximum of 75 standees, 25 on each platform and 25 within the car body. The actual load per train varied from 160 to 180, and the traffic amounted to about 23,000 passengers per hour.

At one Praterstern terminal, five minutes' walk distant, 114 trains with 274 cars an hour carried another 16,000 people. At a second Praterstern terminal, 40 trains made up of 100 cars were available for another 6,000 patrons. A single route at Schüttelstrasse ran 24 trains with 48 cars to carry 3,000 passengers.

Thus it was possible to move 48,000 passengers an hour, of whom 34,000 were brought within easy reach of the concert hall.

Although this business, including general amusement riding, meant an addition of 500,000 rides a day to an average of 2,000,000, it was handled with remarkably little extra cost because most of it came outside the industrial peaks. No new trackwork was required, although a bridge was strengthened and the main station was enlarged. The chief item of expenditure was 10,000




**Personal pass with symbols on the picture side to show sections and areas in which the pass is valid. The names of these areas are written out on the side of the pass carrying the owner's name, address and signature**

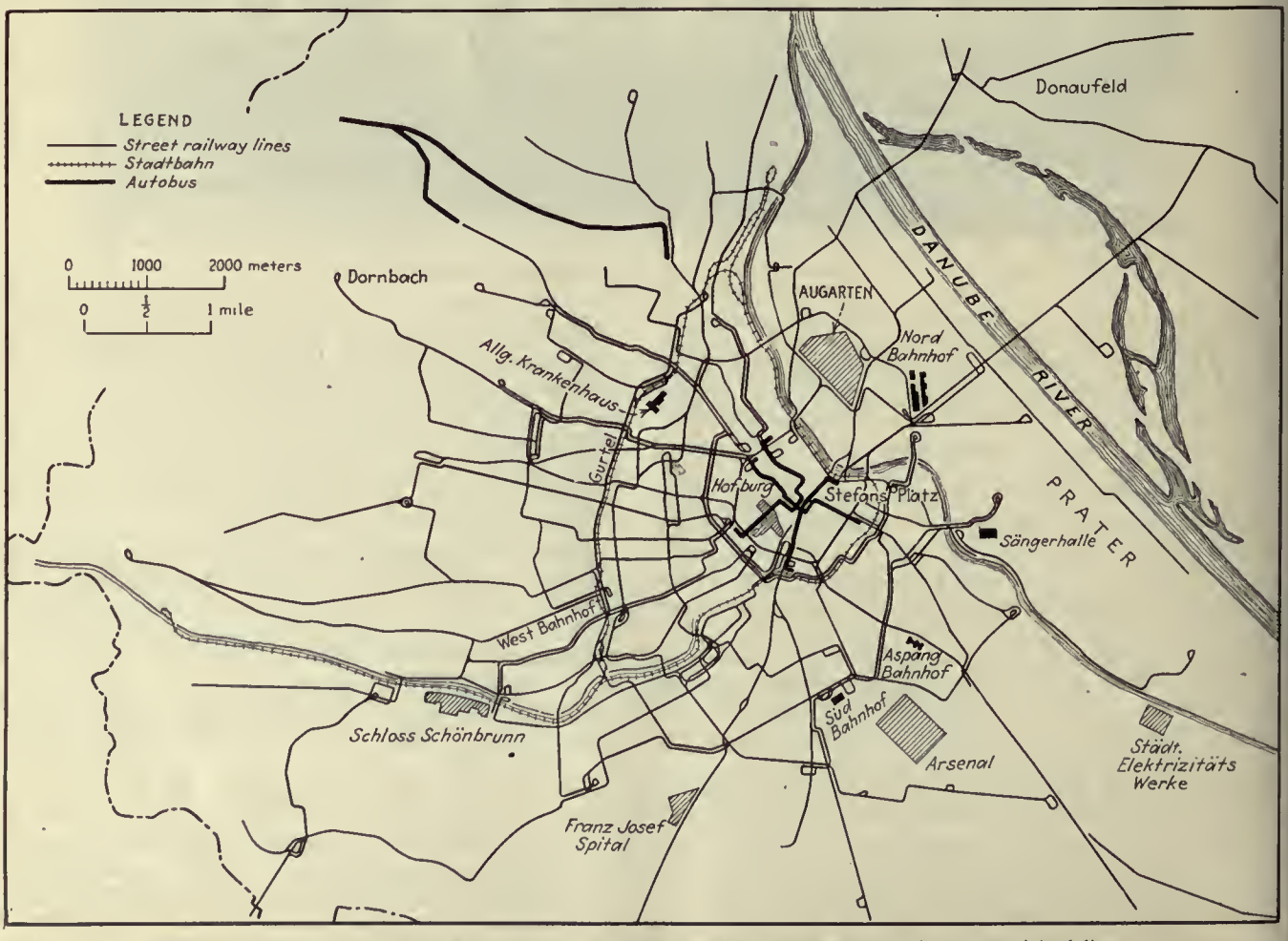
schillings ($1,400) for additional ticket-selling facilities. Shortage of transportation personnel was avoided by suspending all vacations between July 15 and 22. On their own account, also, the men volunteered to work more than the customary hours so that the visitors would feel that even under stress Vienna's transportation system was as efficient as it always has been courteous.

A gratifying feature of the traffic on the music festival days at the Prater was the absence of the sharp peaks that characterize such mass handling as a football crowd. The singers themselves began to arrive for rehearsal early in the morning and they would stay through to the night since there were plenty of restaurants near.

Many concert auditors also came an hour or two ahead of time to amuse themselves on the Ferris wheel, merry-go-round and miniature railway. The end of the concert did not see the Viennese rushing homeward with one mad impulse. Many preferred to stroll through the woods or to enjoy themselves on the various amusements before returning.

Specially marked dash signs in green paint were placed on all cars bound for the concert area. To aid the visitors further, two leaflets were distributed wherever visitors were likely to be. One leaflet dealt entirely with the routing and "last car" data during the five days July 18-22 when night services were extended 2½ hours. The second leaflet was prepared to speed the parting guests in helping to learn just what routes served the different steam railway stations and gave particular care to night-train connections.

During the choral period, the Vienna Municipal Tram-




**Map (Autumn of 1928) of electric railway and bus routes operated by the Vienna Municipal lines**







Above—Dog ticket good only on front platform of Stadtbahn smokers. Dog must be muzzled and on leash

At left—Standard combination fare receipt and transfer costing 28 groschen (3.92 cents)

ways also operated 230 special trains so that groups of singers could be transported en masse between their living quarters and the concert hall.

One fare novelty inaugurated early in 1928 was the sale of three-day, unlimited-ride, transferable passes for the special accommodation of tourists. For many years, the Vienna Municipal Tramways has sold non-transferable passes at a cost well under two ordinary fares a day. This was the first time, so far as the writer recalls, that Vienna passes were sold on the American basis of charging more than two full fares a day. This pass proved popular with the visitors because it relieved them from bothering with transfer regulations and the annoyance of paying extra fares for mistakes. Most Vienna fare receipts, serving also as transfers, have more or less arbitrary number markings that are a mystery to all but the regular rider over a given route.

## Vienna Rolling Stock and Services

It has been mentioned that the extra business incident to the Schubert Festival was not allowed to disrupt the customary transportation of a city of 1,860,000 inhabitants. Although the average age of Vienna motor cars is nearly twenty years and only 50 motor cars (two 70-hp. motors) were new, the peak period found 97 per cent of the equipment on the job as against a normal ratio of 87 per cent.

For the city surface lines, which comprise 288 km. (179 miles) of route or 600 km. (372 miles) measured as single track, there were on hand 1,498 motor cars and 1,827 trailers. These are operated in two-car and three-car trains with one car reserved for smokers. There are 76 routes designated by letters or numbers. The average schedule speed is 9.9 m.p.h. with stops spaced 400 m. (1,312 ft.) apart.

TABLE SHOWING PASSENGERS CARRIED AND CAR-KILOMETERS RUN BY VIENNA MUNICIPAL TRAMWAYS

| | Passengers Carried in Millions | Car Kilometers in Millions |
|---|---|---|
| 1919 (*a*) | 560.713 | 88.759 |
| 1920 (*a*) | 481.495 | 86.556 |
| 1921 (*a*) | 494.902 | 99.783 |
| 1921 (*b*) | 272.985 | 54.166 |
| 1922 (*c*) | 440.754 | 104.133 |
| 1923 (*c*) | 458.475 | 108.412 |
| 1924 (*c*) | 567.384 | 124.287 |
| 1925 (*c*) | 601.510 (*d*) | 141.006 |
| 1926 (*c*) | 615.065 (*d*) | 152.738 |

(*a*) Year ended June 30. (*b*) Six months ended Dec. 31. (*c*) Year ended Dec. 31. (*d*) Includes Stadtbahn.

The rolling stock of the system has shown a continuous, though slow, increase during the past fifteen years. This increase has been due in part, of course, to the co-ordinated operation of the electrified Stadtbahn. Thus at the end of 1913 the system comprised 1,451 motor cars and 1,550 trail cars.

The city cars are 11.6 m. (38 ft.) long over all, 6.1 m. (20 ft.) long over the seating compartment, 3.6 m. (11.8 ft.) wheelbase and 2.24 m. (7.34 ft.) wide. Their average weight is 29,370 lb. Bow collectors are used with a line potential of 600 volts.

For the Stadtbahn, which is an electrified belt and suburban railway with 26.5 km. (16.4 miles) route or 61 km. (37.8 miles) single-track measurement, there were on hand 180 motor cars and 230 trailers. These cars are operated in trains of five to nine cars at running speeds up to 40 km. (24.8 miles) per hour and schedule speeds up to 24 km. (14.9 miles) per hour. Pantograph collectors are used for the line potential of 750 volts.

During the summer of 1928, the motorbus operation of the Vienna Tramways was still confined to the trackless center of Vienna, "The Inner City," except for a single motor bus line in the northern portion of the city and a short trackless trolley line connecting with this suburban bus line. In 1927, 34 buses were operated over 26 km. (16.1 miles) of route. Some of these routes were only 800 m. to 1,000 m. (2,624 ft.—3,280 ft.) long, yet the two-minute to four-minute headways and extremely low fares of 9—10 groschen (1.26 cents —1.40 cents) produced 22 passengers per bus-mile! Before the end of 1928, the Vienna Tramways expected greatly to enlarge its bus operation through the development of a series of express and pleasure routes to suburban areas.

In round numbers, the relative importance of each class of traffic during 1927 was as follows:

Street railways, 630,000,000 passengers with 138,000,000 car-km. (85,560,000 car-miles) or 7.3 passengers per car-mile.

Electrified stadtbahn, 100,000,000 passengers with 21,000,000 car-km. (13,020,000 car-miles) or 7.7 passengers per car-mile.

Motorbuses, 11,400,000 passengers with 837,000 car-km. (518,940 car-miles) or 22 passengers per bus-mile.

A peculiar feature of the Stadtbahn is the fact that but 10,000,000 to 12,000,000 of the 100,000,000 riders did not use surface line transfers. At the height of its pre-war business, when operated as part of the State Railways, the Stadtbahn carried only 40,000,000 riders a year. It is apparent, therefore, that operation of this line, in conjunction with the surface lines, has greatly increased the value of the Stadtbahn through permitting travelers to make combinations that will save time.

The Stadtbahn is leased for 30 years from 1924, though with the right of the Government to cancel the lease after ten years. Under this lease the Vienna Municipal Tramways supplied rolling stock that can be used on the surface lines should this become necessary.

## How Tools Speeded Track Reconstruction in Honolulu

No. 1. The old track became badly rutted as well as worn.

No. 2. The first process was the removal of the old concrete paving with air drills.

No. 3. The final touches to the excavation.

No. 4. A section of 500 ft. of track ready for night displacement.

No. 5. After the joints are seam-welded, this track will be ready for new paving.

No. 6. A section of the finished track.

No. 7. This tractor crane was of great help. It is shown here loading rails on a flat car.



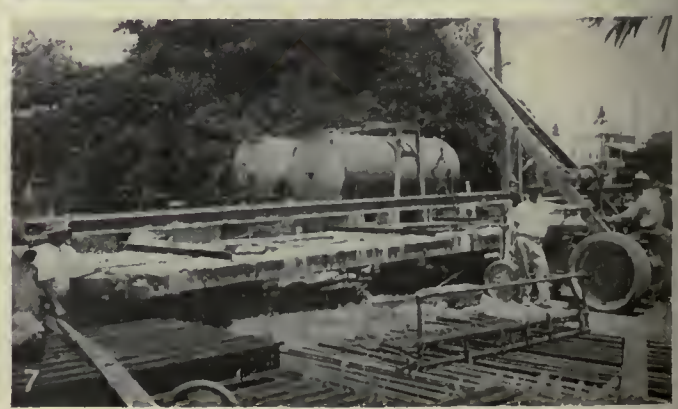












# Rail Replacement in Hawaii

## Honolulu Rapid Transit replaces 5,000 ft. of 70-lb. A.S.C.E. T-rail track with 122-lb. Trilby rail

By E. de Harne
*Roadmaster Honolulu Rapid Transit Company*

NOT LONG AGO the Honolulu Rapid Transit Company decided to renew the rail on about 5,000 ft. of track in paved street. The old track built in 1917 consists of 4⅝-in. 70-lb. A.S.C.E. T-rail, laid on wood ties. The original ballast was set deep enough to permit re-railing this section of line with a 7-in. rail. The old paving between the tracks was of concrete with a line of wood blocks inside each rail. Wood blocks were used outside both rails.

The new track, which the company decided to lay, consisted of 7-in. 122-lb. grooved rail of the Trilby section, laid on creosoted redwood ties. To this rail the fish plates were seam-welded and the nuts of the bolts were spot-welded to the plates. No bonds were used. Concrete paving 7 in. deep was installed, carried to additional depth of 4 in. under the rails and between the ties. An asphalt squeegee surface was applied.

Since the grade had to be lowered, 2⅜ in. re-railing had to be done at night while the cars were not running. This was accomplished by removing the old rail and installing the new rail for 500 ft. of track each night by a force of twenty men and a 1-ton Fordson tractor crane. The Fordson crane, used for the first time for handling all rails, resulted in a big saving in track and roadway labor. The rails were hauled to the job with a flat motor car. Six weeks were required to complete the job, and the cost was found to average $6.94 per linear foot. Track and roadway labor averaged $0.86 per linear foot, and total labor $2.28 per linear foot.

# Freight Is Principal Subject at Coming C.E.R.A. Meeting

SEVERAL men prominent in the industry, headed by J. P. Barnes, president of the American Electric Railway Association, have been secured to address the Central Electric Railway Association, which convenes in Indianapolis, Ind., on Jan. 24-25, 1929. Addresses will be delivered on the opening morning by Mr. Barnes, L. Ert Slack, Mayor of Indianapolis, W. S. Rodger, general traffic manager Eastern Michigan Railways, and R. N. Van Doren, vice-president and general counsel, Chicago & Northwestern Railway.

The afternoon of the first day has been set aside for the general subject of freight. Following a report of the committee on pick-up and delivery of freight, a paper will be read on "The Trend in the Development of Pick-Up and Delivery Freight Service," by L. G. Tighe, assistant general manager Northern Ohio Power & Light Company. D. R. Thomas, president of the Electric Railways Freight Company, will present a paper on "Advantages of Freight Consolidation."

Papers to be presented at the second day's session include "Traffic and Schedule Making," by J. R. Ong, transportation engineer Cincinnati Street Railway; "Interurban Operation, Possible Economies and New Methods," by C. T. Dehore, president Indianapolis & Southeastern Railroad, and "Personnel," by W. P. McCarter, supervisor of instruction Milwaukee Electric Railway & Light Company. These will be followed by the reports of committees and affiliated associations, and election of officers. The association dinner and dance are to be held on the evening of the first day.

The executive committee of the association will hold two meetings at Indianapolis, one preceding the opening session of the convention and another after adjournment of the final session on the second day.

# Attractive Substation Serves Four Pittsburgh Lines

By M. R. Sumner
*General Superintendent of Construction*
*Byllesby Engineering & Management Corporation, Pittsburgh, Pa.*

NO SACRIFICE of attractiveness was made by the Duquesne Light Company in constructing its new Maple atttomatic substation, even though the structure was built economically. It was erected in a residential section but is a distinct asset to the neighborhood. The building itself is well designed, but to add to the appearance an ornamental iron fence was erected along the front of the lot.

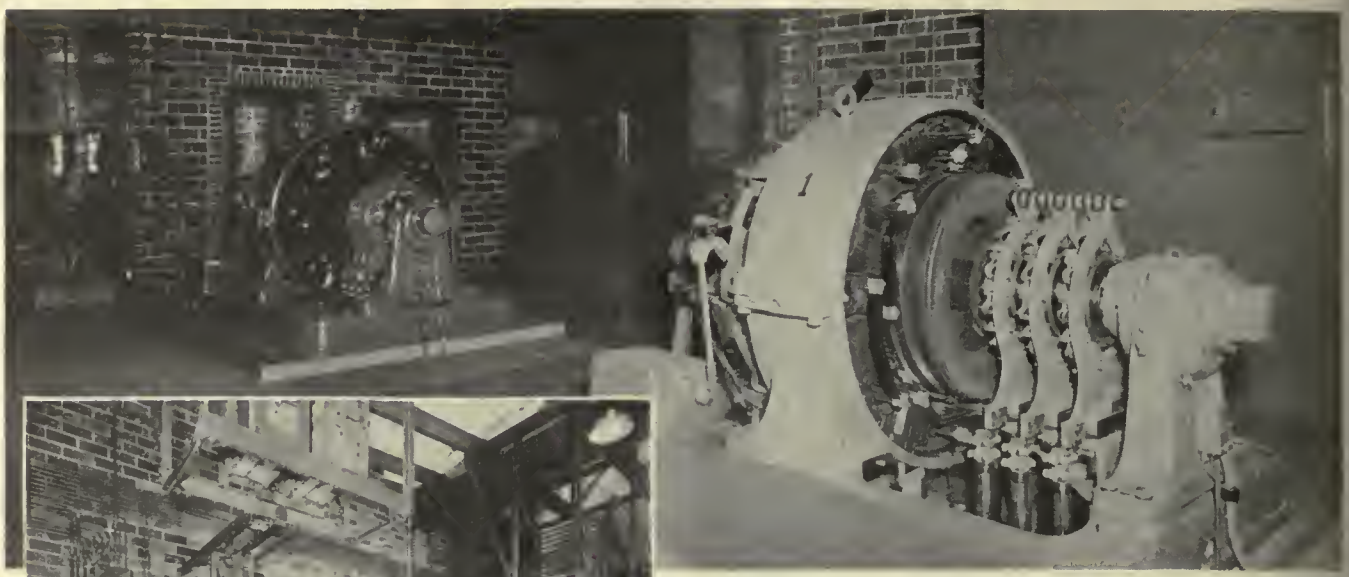
Located in Wilmerding, Pa., about 12 miles from Pittsburgh, this railway substation supplies current to



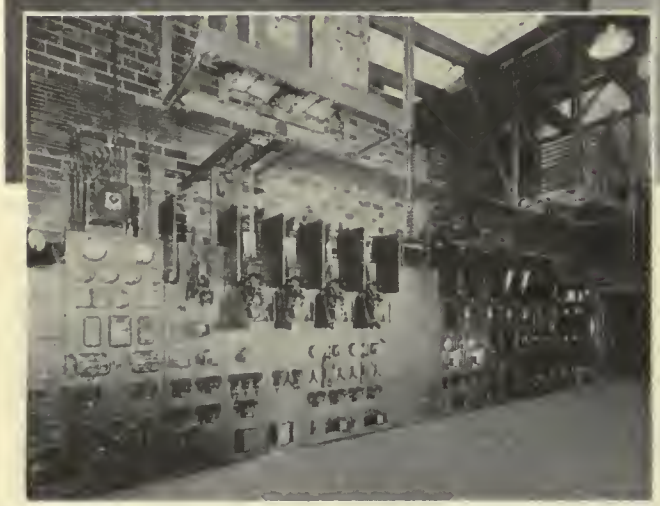
**An ornamental iron fence adds to the attractive appearance of the new building**

TABLE I—EQUIPMENT OF THE MAPLE SUBSTATION OF THE DUQUESNE LIGHT COMPANY

| |
|---|
| Starting and running oil circuit breakers, type B-2, three-pole, single throw, complete with contactors and operating mechanism. |
| Load limiting resistors 0.030 ohms, 4 units. |
| Field discharge resistor, 2 units. |
| Synchronous converter, six-phase, shunt-wound. |
| Potential transformer, outdoor, three-phase, 22,000-11,000/110 volt. |
| Air break switch, three-pole, single throw, motor operated, type PM. |
| Air break switch, three-pole, single throw, gang operated, with grounding blade, type PM. |
| Air break switch, three-pole, single throw, gang operated, type PM. |
| Switchboard complete for control of two 1,000-kw. synchronous converters. |
| Storage battery, 60-cell, type OG-13. |
| Battery charging set, one-phase, 60-cycle, 220-volt motor and 140-volt d.c. generator. |
| Air compressor. |



Four outlying lines of the Pittsburgh Railways are supplied with current from the two 1,000-kw. synchronous converters

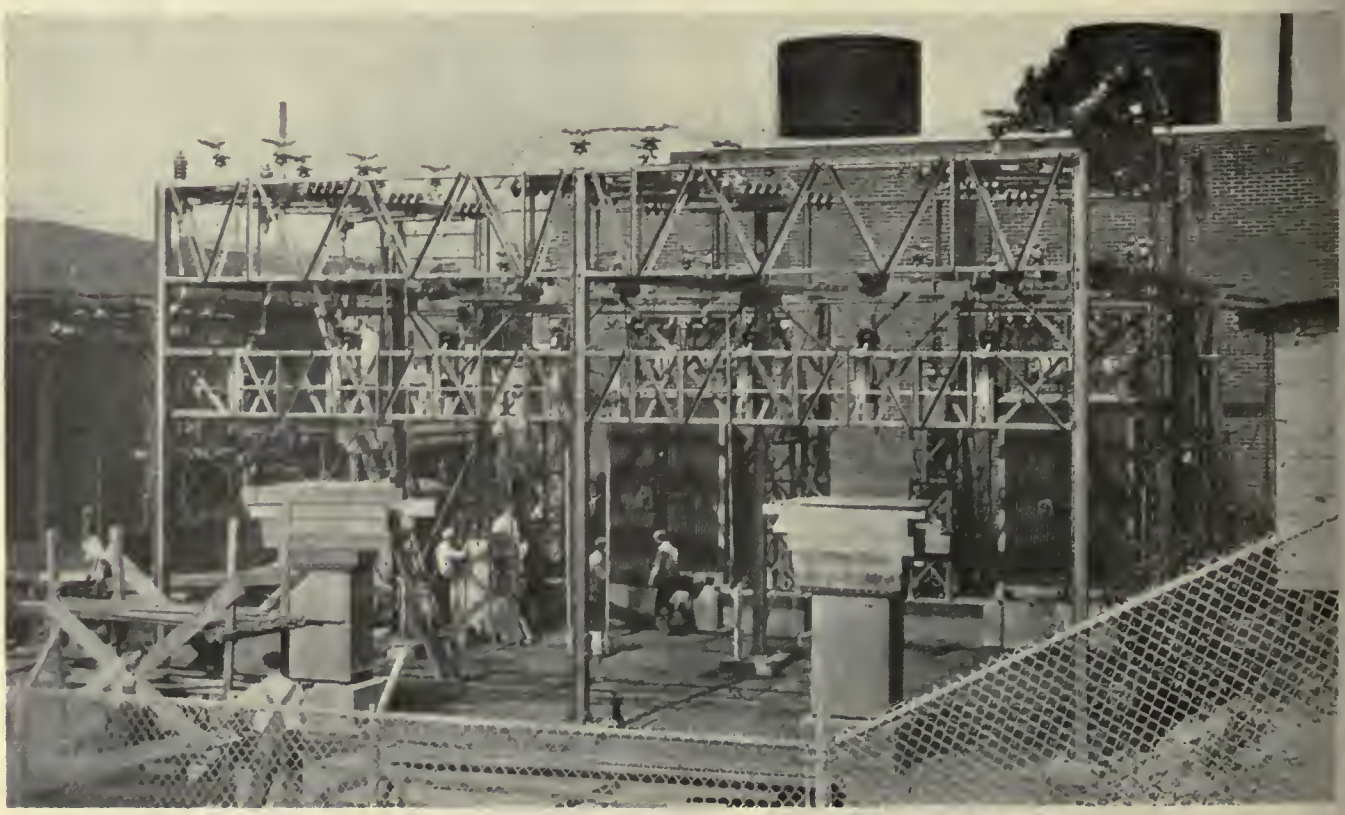


This switchboard is complete for the automatic control of the two 1,000-kw. synchronous converters in the substation

four lines of the Pittsburgh Railways, approximating a total length of 16 miles. These lines are (1) the Trafford City line from Wilmerding to Trafford City; (2) the McKeesport line from Wilmerding to East McKeesport; (3) the lines in East Pittsburgh and the Turtle Creek district, and (4) the Ardmore line from East Pittsburgh to Edgewood Acres.

Electrical equipment of the station consists of two 1,000-kw., 600-volt, shunt-wound synchronous converters and four 600-volt feeder panels housed inside a permanent brick building. The high-tension bus structure and the bank of transformers are located out of doors at the rear of the station. The equipment is summarized in the accompanying table. To date the average load on the station has been 800 kw. with a peak demand approximating 1,000 kw., well within the capacity of one converter unit.

The building, including foundations and lighting, cost $34,000; the electrical equipment, outdoor and indoor,



The substation was in service eight months after its construction was authorized

including telephone lines, cost $95,000; land improvements, grading, seeding and fences added $4,000; outdoor switching structure, exclusive of equipment, cost $3,000, and poles, fixtures, overhead and underground conduit lines, engineering, insurance, etc., amounted to $17,000, making a total cost of $153,000. Construction of the station from authorization of the work to the official opening occupied just eight months.

## Utility Association Secretaries Meet in New York City

CLOSER co-operation between regional organizations and the national headquarters of the various public utility associations was the principal topic of discussion at the seventh annual conference of Utility Association Secretaries which met in New York City on Dec. 3-4-5, 1928. The delegates were the guests of the A.E.R.A. during the first day of their conference. The meeting at association headquarters was opened with an address of welcome by General Secretary J. W. Welsh. Managing Director Storrs spoke briefly on the present status of the electric railways of the country, and was followed by Frank R. Coates, chairman of the committee for co-operation with state and sectional associations, who made a plea for closer relationship between the various regional associations, through their secretaries, and the national headquarters organization in New York City. Labert St. Clair, of headquarters staff, read a letter from President J. P. Barnes, expressing his regret at his inability to be present, and commending the regional secretaries for the work which they were doing for the utilities in their respective spheres. The morning session concluded with an inspection of the A.E.R.A. offices under the auspices of Mr. Welsh and members of the staff.

Reconvening in the afternoon, the conference was addressed by George B. Cortelyou, chairman of the joint committee of the national utility associations. Members of headquarters staff then spoke briefly, outlining the duties of their respective departments.

On the second day of the conference the delegates were the guests of the American Gas Association, and on the third day of their stay were entertained at the headquarters of the National Electric Light Association, the program in both cases being under the direction of the secretaries of the associations named. President E. F. McKay presided over the sessions, with O. E. Weller as secretary. At the concluding session, Mr. Weller, who is secretary of the Rocky Mountain Division of the N.E.L.A., with headquarters in Denver, was chosen as president for the ensuing year, with Harold A. Buck, Harrisburg, Pa., as secretary. The date and place for the next meeting was fixed for the first week in December, 1929, at Chicago.

## Kentucky Utilities Meeting

THE annual meeting of the Kentucky Association of Public Utilities will be held at the Brown Hotel, Louisville, Ky., on Jan. 15 and 16, according to an announcement which has just been made by the secretary, Edward F. Kelley.

On the afternoon of Jan. 15 and the morning of Jan. 16 business sessions will be held in the Roof Garden. The annual dinner will be in the Crystal Ball Room on the night of Jan. 15.

# Two Hundred Dollars for a Single Idea

PERHAPS the very job that you were doing this morning has prize-winning possibilities. Are you familiar with the opportunities offered in ELECTRIC RAILWAY JOURNAL'S maintenance contest? Read about the prizes that can be won and the rules and conditions of the contest as given in the Oct. 20 issue of the JOURNAL, or send for copies of an instruction folder giving full information.

Progressive maintenance men always keep their eyes open and their minds alert for new ideas. They look ahead. They want to know what is going on not only in their own field of work but in the industry as a whole. The maintenance contest offers opportunities not only for obtaining new ideas for your own work, but also for creating interest and co-operation in the work of your department. At the present time much rehabilitation and improvement in equipment and methods is going on among electric railways. Results have been most gratifying both as to the performance obtained and the savings effected. It is with the thought of giving increased stimulus to such programs, and of bringing to light further commendable accomplishments, that the various prizes have been offered in ELECTRIC RAILWAY JOURNAL'S contest.

There are twelve $25 departmental prizes to be awarded to individuals sending in winning maintenance ideas. These will be divided equally between the following four maintenance divisions:

1. Rolling stock and shops
2. Way and structures
3. Electrical and line
4. Buses and garages, including shop equipment for bus maintenance.

The most attractive prize of all will be the $200 individual prize, to be awarded at next year's anual convention to the person submitting the best maintenance idea during the contest.

Company and departmental recognition are features of the new contest. A company trophy will be presented, and departmental certificates of merit will focus attention on the improved methods and equipment that are being originated by electric railway maintenance forces. For each item published $5 will be paid, whether it wins a prize or not.

Now is the time to start sending in your material. The more you submit, the bettter chance you have of winning one or more of the big prizes. Look up the announcement in the Oct. 20 issue of the JOURNAL or send for copies of the instruction folder.

# BETTER MAINTENANCE Through Improved

## Raising Car Bodies for Oiling Bearings*

By Harvey L. Bullock
*General Foreman of Electrical Equipment*
*New York Central Railroad,*
*White Plains, N. Y.*

FOR oiling the center and side bearings of its cars, the New York Central Railroad, at its White Plains, N. Y., shops, uses two standard Whiting electrically-operated jacks to raise the car bodies. With this equipment the oiling crew can grease all of the center and side bearings on a train of cars, as it comes into the shop for inspection, in a very short time.



Raising a car body with a standard car jack to oil the center and side bearings

Jacks are placed near one end of each side of the car to be greased, and are both raised simultaneously. Current for operating the jacks is supplied from the overhead trolley through a pole with a contact. One man controls the operation of both jacks. In the accompanying illustration showing the raising of a car body, the control button is in the hand of the operator.

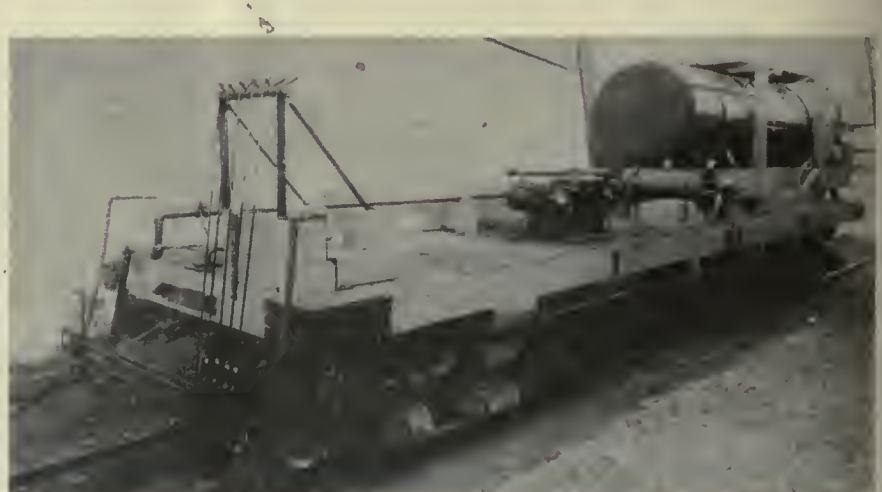
A long length of cable reaches from the contact pole to the jack, and is then looped over a hook. Connection between the jacks is by a lead with plugs, and standard receptacles on each jack are provided so the lead can be removed when not in use. With this arrangement one man raises the car body, while the crew does the oiling. The jack is then rolled to the next position, and the operation repeated until the entire train has been greased.

**Submitted in* Electric Railway Journal *Prize Contest.*

## Special Car for Weed Killing

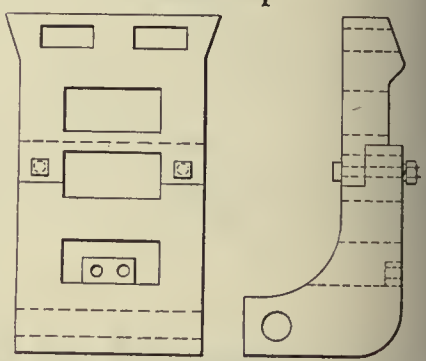
TO FACILITATE the killing of weeds along its right-of-way the Steubenville, East Liverpool & Beaver Valley Traction Company, East Liverpool, Ohio, installed a complete weed-killing outfit on one of its flat cars. Inasmuch as such a car is used only two or three times in a year on a small property, a large outlay is not warranted. The car is 35 ft. long, is mounted on 24-in. wheels, and has standard spray piping and control valves located at the front end of the unit.

The Chipman weed-killing solution is carried in a 40-bbl. steel storage tank fixed securely in position at one end of the platform. A car type of air compressor is mounted amidships of the car together with an air reservoir for maintaining 12 lb. pressure in the large solution tank. The car is equipped with hand brakes and is ordinarily operated in conjunction with a company work car at an average speed of 12 m.p.h. A regulation headlamp plug provides the means of conveying electrical energy to the air compressor of the weed car from the trolley circuit of the motor car.



This special car for weed-killing equipment forms a useful working unit of the railway

## Renewable Third-Rail Shoe Tip



Adoption of this contact shoe has resulted in a great saving in maintenance expense, and its operation has been entirely satisfactory

WHEN the cars of the Staten Island Rapid Transit Railway, Staten Island, N. Y., were put into service they were equipped with third-rail shoes somewhat similar to the de-

# Methods

sign shown in the sketch, but of one piece. It was soon found, however, that the expense of shoe maintenance was very high, because, when the contact surface became worn or the tip broken it was necessary to replace the entire shoe from the fulcrum to the top. The cost of the casting plus the cost of the replacement labor amounted to a large sum.

The shoe shown in the sketch was designed and installed to decrease this cost. This shoe is made in two parts, a fulcrum casting and a tip casting. The joining points are machined accurately to assume perfect contact when bolted together. In case the tip becomes worn or broken, it can be replaced in a few minutes by removal of the bolts.

## Preventing Signal Relays from Sweating

IN A REPORT of the Signal Section of the American Railway Association which was presented at the section's annual convention there are some recommendations which should prove of value in maintaining signals for electric railways. A section on the prevention of sweating of relays is as follows:

1. Relay housings, including the door, shall be non-metallic, or metallic, with non-metallic lining.

2. Non-metallic housings and non-metallic lining of metal housings shall be constructed so as to close as near airtight as practicable. The outside metal housing shall be ventilated by openings near the bottom and the top of the housing, the openings covered with wire gauze to exclude dirt and insects, and hooded to exclude rain.

3. The voids between and around the wires at the point where they enter the relay housing shall be filled with a compound that will seal the opening and exclude moist air from the conduit leading to the housing. Where housings with open bottoms are mounted on concrete foundations, the surface of the concrete shall be covered with material that will prevent the entrance of moisture into the housing.

4. Glycerine in a small open container placed inside the relay housing has been found to be beneficial. Moisture-absorbing chemicals, except glycerine, shall not be used on account of injurious corrosive action.

5. Relays should be sealed as nearly airtight as practicable.

## Trackless Lift Convenient for Handling Equipment*

By C. B. Hall
*Chief Clerk Mechanical Department Virginia Electric & Power Company, Norfolk, Va.*



**Portable lift in place for removing a pair of 34-in. steel wheels**

USE of a portable lift in the shops of the Virginia Electric & Power Company, Norfolk, Va., has resulted in better maintenance of equipment by simplifying the labor of handling. The machine is a self-contained type designed to remove and replace car motors, wheels, etc. It has a telescopic ram and does not require a sub-pit. It is mounted on flat, broad wheels so that it can be moved easily. The ram and cylinder are steel, and pump valves and pump pistons are bronze. There is a side adjustment of the cylinder of 2 in. The weight of the machine is 700 lb. and it has a lifting capacity of 3,000 lb. The length is 37 in., and the over-all height, with ram closed, is 32 in. Use of this lift has resulted in a considerable saving in the time and labor of removing and replacing equipment under cars without jacking up the car body.

*Submitted in Electric Railway Journal *Prize Contest.*

## Chemical Fire Extinguishers Centralized

STUDY of the fire fighting apparatus in the shops of the Richmond Railways, Inc., Staten Island, N. Y., led to a new arrangement of the chemical extinguishers. Heretofore they were placed around various parts of the shop but it was found when an emergency arose that confusion developed, resulting in a loss of time in procuring the necessary extinguishers. All extinguishers are now centralized on a common rack in one location in each department and are accessible from all directions. The accompanying picture shows a typical arrangement of the extinguishers installed in the paint shop. In addition, a multiplicity of water and sand pails are located conveniently throughout the shop.

With the new arrangement every man knows exactly where the extinguishers can be found, and confusion and delay are prevented when an emergency arises.



**Fire extinguisher board in the shop of Richmond Railways, Inc.**

# Helpful Equipment *from the* Manufacturers

## Light Weight Trolley Base

A TROLLEY base of all steel construction weighing 73 lb. has just been announced by the Ohio Brass Company, Mansfield, Ohio. It is claimed that this new base, while eliminating much of the weight, has not sacrificed strength, pole tension nor current carrying ability. This is due to the use of a rolled-steel assembly with a cast steel turret.



Light weight trolley base

The new base is equipped with Timken roller bearings, and a current shunt protects the bearings from pitting and assures a constant current flow from turret to base. Bases can be procured with light, medium or heavy springs to meet various service requirements.

Ease of lubrication and accessibility are also embodied in this design. The removal of one nut is all that is required to remove turret for inspection or adjustment.



Sectional view of turret of new trolley base

Service trials have shown that due to the lighter oscillating weight, the spring tension can be decreased materially thus causing less wire wear, less hammering of ears and fittings, and less crystallization of parts with which the wheel comes in contact.

## Heavy-Duty 300 Amp. D.C. Welder

SIMPLICITY, sturdiness and compactness are combined in a 300 amp. d.c. arc welder, a recent development of the Westinghouse Electric & Manufacturing Company. The welding unit was designed and constructed for heavy duty work and continuous economical service, in the shops and field where only direct current is available for the driving motor. This set is particularly applicable where the all-day load exceeds 200 amp.



Heavy-duty arc welder using direct current

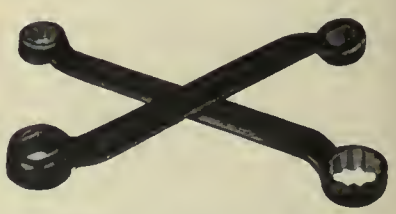
The driving motor and the generator are enclosed in the same frame, while the control is mounted on top, being in a part of the frame and protected by a sheet steel cabinet. A common shaft with a ball bearing at each end is used for the generator and driving motor. The unique construction of this welder gives it small overall dimensions and a low center of gravity. Three roller bearing wheels may be attached to the frame if it is to be portable. If intended for stationary use, the running gear parts are omitted.

The driving motor is designed so that it can be used on either a 230 volt or a 550 volt line, being of a special constant speed type S.K., compound wound. The motor control, mounted in the control cabinet, is a starting rheostat providing low voltage protection. The generator, a single operator, constant current, differentially compound wound type, is separately excited from the motor supply and has a welding range from 75 to 400 amp. Simple welding control is secured by a one-dial rheostat. Any desired welding current, over the entire range, can be obtained readily by the proper dial setting. A 690-amp. meter and a 0 to 125-volt meter are mounted on the control panel.

The rating of this heavy-duty arc welder is 300 amp. for one hour, with a 50 deg. C. rise on a resistance load at 25 volts, which conforms to the N.E.M.A. standard practice.

## Valve Stem Wrenches

DESIGNED especially to set valve stem nuts firmly, Stevens Walden-Worcester, Inc., have placed a new valve stem wrench set on the market. Wrench No. 481 is $\frac{5}{8}$ in. and $\frac{1}{2}$ in. Doublehex box type. It passes easily over the valve stem and one end fits the $\frac{5}{8}$ in. nut on large diameter stems, while the other fits the $\frac{1}{2}$ in. on smaller stems. The companion wrench No. 482 is $\frac{7}{16}$ in. and $\frac{1}{2}$ in. oval box type to grip the oval shape of all standard diameter straight stems, thus holding it firmly in place while the nut is set or loosened. These wrenches are drop forged.



New pair of valve stem wrenches

# News of the Industry

## Philadelphia Men Sworn in as Special Officers to Speed Traffic

Thirty-seven men picked from the personnel of the Philadelphia Rapid Transit Company, Philadelphia, Pa., for their experience in expediting traffic, have been sworn in as special officers and assigned to the central city area to co-operate with the city's traffic police in measures calculated to relieve congestion.

The P.R.T. supervisory force, according to an announcement made by Ralph T. Senter, president of the company, will assume responsibility for all public transportation in the district between Spring Garden and South Streets, 34th Street and the Delaware River. They will wear a distinctive uniform of military gray.

"The company evolved this plan," said Mr. Senter, "as a logical phase of coordinated operation of all forms of surface transportation.

"Our men will in no way attempt to usurp the authority of the city traffic personnel."

In commenting on this move the Philadelphia *Ledger* said:

The installation of this special force is unique and anomalous. Since the city is unable to provide the needed numbers of traffic police to cope with conditions where the congestion is greatest, it should be glad to accept the assistance of men who have a direct interest in doing their job efficiently and for the benefit of the greatest number. They will be on the streets to answer the question, "how to speed up traffic for the 80 per cent," and as the interests of the P.R.T. and the large majority of the users of the streets are identical, they will have great opportunities for usefulness.

## Daily Meetings on Chicago's Ordinance

Representatives of the Chicago transit companies and members of the City Council sub-committee on local transportation have decided to consider the proposed traction ordinance at once, and to meet every day until they have agreed upon the draft of the new ordinance, or until they definitely have reached an insurmountable obstacle.

The draft as it now stands has been approved by the Council sub-committee. It provides for a rate of return of 5½ per cent on the $257,000,000 investment represented by the present elevated and surface lines and that additional capital shall be put in at cost. The companies have been asking a 6½ per cent return on the present capital account, plus one mill per revenue passenger and a compromise of this must be effected.

Attorneys for the companies insist that the 6½ per cent return, plus the compensation feature, is imperative at the present time, and that future rates could be determined by the proposed local transit commission. Some of the Aldermen, however, desire a fixed contract so that the rate of return will never be higher than the amount finally agreed upon. This point will be put aside temporarily until all other negotiations have been completed, both groups agreed.

The city is also asking that interest be paid on its $53,000,000 traction fund, which is to be invested in the bonds of the new unified company. Objections originally raised on this point by company representatives have been withdrawn. The question of length of time the franchise should run has been tentatively agreed upon as that specified in the ordinance draft, which provides for termination upon purchase. It is estimated that the city can purchase the consolidated system within 40 years out of its share of the company's profits.

Both groups are now confident that the ordinance will be in shape to submit to the City Council after Jan. 1. If approved by the Council, bills authorizing the city to call a special public referendum on the ordinance could then be submitted to the State Legislature, which convenes in January.

## New Fares in Effect in Baltimore

### Rejecting 10-cent flat rate, commission authorizes 8¾-cent ticket rate. Supplemental opinion reviews depreciation contention. Company contests return rate

BALTIMORE car riders are now paying 10 cents for single cash fares and 8¾ cents when tickets or tokens are purchased. The new rates authorized by the commission and announced in the ELECTRIC RAILWAY JOURNAL, issue of Nov. 30, are an increase from 9 cents cash or three tokens for 25 cents.

In handing down its latest order the commission accompanied it with a supplemental opinion in part as follows:

In obedience to the mandate of Circuit Court No. 2 of Baltimore entered Aug. 31, 1928, in accordance with an opinion of the Court of Appeals, in the case of Harold E. West, et al., versus the United Railways & Electric Company of Baltimore, filed July 16, 1928, this commission on Monday, Nov. 19, 1928, entered upon a rehearing of Case No. 2648, in so far as it concerned the annual allowance for depreciation on the property of The United Railways & Electric Company of Baltimore made in the opinion and Order No. 12639 of the commission, filed Feb. 10, 1928.

The order of Circuit Court No. 2 of Baltimore directed the commission to further consider the question of depreciation, determine the proper allowance for depreciation in accordance with the opinion of the Court of Appeals, and make any change in the rate schedule which may be necessary and requisite.

In its opinion and Order No. 12639, this commission allowed 5 per cent of gross revenue as a proper amount to be set aside for depreciation upon the company's depreciable property. The amount so estimated for the year 1928 was $883,544. This allowance of 5 per cent of the company's gross annual revenues was made first in 1912, the year in which a depreciation reserve was set up by the company, and it has continued since. It has provided for current retirements of the company's property at cost, and permitted the building up of a reserve, at the beginning of the year 1928, of $1,413,739. The plan of providing for retirements at cost is that followed by the Interstate Commerce Commission and the utility regulatory commissions of most of the states, and by all other utilities under the jurisdiction of this commission.

The commission, therefore, did not feel justified, in the circumstances, in departing from the generally observed rule of allowing depreciation on a basis of cost.

The company's contention that value, and not cost, is the proper basis upon which to calculate depreciation was sustained both by Circuit Court No. 2 of Baltimore and by the Court of Appeals.

In its opinion the Court of Appeals asserted that while there is authority for calculating depreciation on the basis of cost, "in our opinion it is artificial, illogical and unsound, and ought not to be approved." The court continues:

"Since we cannot say that proper methods would not have produced a result which would have affected the rate schedule adopted, the case should be remanded to the commission in order that it may consider and determine the proper allowance for depreciation in accordance with rules hereinafter stated, and if necessary readjust the rate schedule to cover any changes it may make in that allowance."

Later the court declares:

"In such a case as this we are . . . dealing . . . with substantive rights protected by constitutional guaranties, and there seems to be no logical reason why the depreciation should not be based upon the actual value of the property itself, rather than upon vague and conjectural inference drawn from the money the property earns. . . . But even so, if the conclusion actually reached was proper, the fact that it was reached by improper methods, would not justify us in disturbing it, so that the more important question is whether the base of the calculations by which it was tested was itself lawful. And that depends upon whether the commission should have based its allowance for depreciation upon the original cost of the prop-

erty, or upon its present value. It actually did use cost and not present value as the basis of its conclusion, and here again it must be said that there is authority for its procedure. But in our opinion it is justified by neither law nor right reason."

### Inspection and Investigation of Property

The court directed the commission to make a physical inspection of the property and an investigation of the probable useful life of the property as shown by the experience of this company and other companies using similar properties in a similar way and to make an estimate, based in part at least upon such an investigation of the probable annual depreciation. This the commission has done.

The annual amount claimed by the company for depreciation was $2,200,000. This, however, in the opinion of the commission, provided for certain extraordinary obsolescence, which the Court of Appeals declares the commission does not have to allow, and which it does not allow. H. Carl Wolf, chief engineer of the commission, under whose direction the commission's investigation and physical inspection of the property were made, testified that the fair amount to be allowed for depreciation, based upon the fair value of the property, is $1,687,068. Charles Nodder, chief auditor of the commission, approaching the problem from another angle, that revealed by the experience of the company as shown by its books, testified that the amount required for depreciation, based on present fair value, is $1,269,565.25.

The commission carefully has considered all the testimony and exhibits before it in this case bearing upon the problem of depreciation, and finds that $1,638,660 is the proper amount to be allowed the company for depreciation. This allowance is based upon the present value of the company's depreciable property, in accordance with the court's order, and equates to 3.6 per cent of the amount testified to as being the value of the company's depreciable property, $45,518,344.

In determining this allowance it is assumed that the existing practice, with respect to the division between charges for maintenance and charges to the depreciation reserve, will be continued.

The allowance of $1,638,660 is an increase of $755,116 over the allowance previously found, which was based upon the cost of the company's property, and necessitates an increase in the rate of fare from 9 cents cash or three tokens for 25 cents to 10 cents cash or four tokens for 35 cents. Other fares will remain as established by Order No. 12639.

The commission will pass an order in accordance with the findings herein stated.

### Amended Order Defines Fare

In the order passed by the commission on Nov. 28, it amended its order of May 26, of this year, to read in part:

That from and after midnight on Nov. 30, 1928, and until the further order of the commission, The United Railways & Electric Company of Baltimore shall be permitted to charge and collect for the transportation of persons over its several street railway lines in Baltimore and vicinity, a base rate fare of 8¾ cents when tickets or fare checks are purchased, or 10 cents cash, for the conveyance of each passenger over twelve years of age, and 5 cents for each child between the ages of four and twelve years, between any of the points designated in the schedule of the said company or between intermediate points, in either direction, on any of such lines, except in so far as the zones on any of the said lines are hereinafter modified or changed.

### Rate of Return Made An Issue

The United Railways & Electric Company has decided to appeal from the action of the Maryland Public Service Commission. The case is to be taken to the United States Supreme Court. President Emmons said that the United is being discriminated against and that refusal to permit the company to receive an adequate return has caused it a loss of $15,000,000 in the last two years through depreciation of securities. This is a point that has been reiterated previously. He said:

It has been decided to proceed with an appeal to the courts so that the question of the sufficiency of the rate of return, as previously fixed by the Public Service Commission at 6.25 per cent, should be decided as promptly as possible by the Supreme Court of the United States in order that this problem, of so much importance to the entire public of Baltimore and the future of the street railway system, the investors of Baltimore and elsewhere who hold securities of the United Railways, as well as the company itself, may be finally settled.

Not only do we feel that the 6.25 per cent return is confiscatory, but it stands as an economical barricade in front of the company and as a menace to the future railway transportation in Baltimore. When other Maryland utilities are allowed a 7½ per cent return, and the railway is confined to 6.25 per cent return, the investor naturally will lend his money to the company which the state treats more liberally.

The public will need new cars in the future of a more convenient type and more perhaps in line with the comforts of buses, and also better facilities generally for transporting passengers quickly and comfortably. All of this requires money on a very large scale.

If it cannot be obtained the future of transportation in Baltimore is in a bad way, indeed, and it cannot be obtained until the background of credit given the company by public authorities is sufficient to attract investors.

We feel it is understood by the general public that the recent increase allowed by the commission is for the purpose of maintaining the property itself, and does not include any item at all for increased service or facilities.

## Another Railway Problem

SEVENTY citizens of Hudson, N. H., have appealed to the Public Service Commission to take action that will relieve them of annoyance in the way of interrupted radio reception. The petitioners believe that the trouble is caused by operation of electric cars from Hudson bridge to Hudson center and they point to confirmation of their opinion in the fact that it does not exist when the cars are not running. They ask the commission to take such action as may be necessary to remedy an "exasperating condition."

## Report of Rolling Stock Committee

Outlining of work and discussion of best methods of getting information for reports occupied the attention of the general rolling stock committee at a meeting held at association headquarters, New York City, on Dec. 5. Those present were A. T. Clark, chairman; W. S. Adams, C. Bethel, J. M. Bosenbury, J. A. Brooks, R. S. Bull, M. R. Hanna, G. C. Hecker, E. J. Jonas, J. S. McWhirter, A. D. McWhorter, T. H. Nicholl, H. A. Otis, M. W. Rew, H. Savage, R. B. Smyth, C. W. Squier and W. T. Vivian.

Changes in the procedure for making reports and the dates at which they must be presented were outlined by Mr. Clark. The committee on revision of the manual will undertake to add several standard axles to those already available, and the rating of others will be increased. The progress being made in testing of various drives under the direction of the committee on car design was outlined. The Westinghouse drive is now under test. The General Electric drive is being set up for testing, and the Timken drive is on the way.

In addition to further studies of lighting the subcommittee on this subject will devote added attention to headlights for city cars. The committee on noise reduction will devote special attention to track construction that bids promise of providing quiet operation.

There was considerable discussion on the work being done by committee No. 10 on welding of wheel flanges. The amount of work of this character being done by electric railways is increasing very rapidly, and this has led to a preference for grinding wheels instead of turning them in a wheel lathe, as in many cases the amount of metal necessary to be removed for truing up the contour is very small. Present grinding equipment for this use, however, is very costly, and railways hesitate to make such a large investment.

The committee agreed that wood preservation in car and bus construction is a worth-while subject for study by the wood preservation committee. The next meeting of the committee will be held at Cincinnati about the middle of March. At this meeting all committees of the rolling stock division will be expected to get their reports in shape. All members of rolling stock special committees are invited to attend this meeting, and others interested in rolling stock will also be invited.

## Mayor Wants New Operating Agreement with P. R. T.

The City Council's transportation committee will meet shortly to act on Mayor Mackey's request for authority to negotiate a new operating agreement with the Philadelphia Rapid Transit Company for the Broad Street subway in Philadelphia, Pa.

The Mayor sent a special message to

Council on Dec. 3 pointing out that the three-month lease expired Nov. 30, that the P. R. T. had discontinued its payments of $200,000 a month for operating privileges, and that a new contract would have to be executed pending the completion of the South Broad Street unit.

On a day-to-day basis the company is now operating the city-owned line. The new agreement will be made retroactive to Dec. 1.

## More Militant Moves in Detroit

Recent developments in Detroit include moves on the part of Mayor John C. Lodge to banish jitney service of any kind from Detroit streets unless the jitneys are municipally owned and operated; to evict the Detroit Motor Bus Company's buses from the streets; to have two subway plans placed upon the ballot at the April election so that the voters may take their choice. One of the subway propositions would be the comprehensive subway plan of the Rapid Transit Commission, estimated to cost $280,000,000. The other would be a subway dip plan with an estimate of cost, for the relief of traffic congestion in the downtown streets.

It is believed that the Mayor's suggestion relative to the eviction of the Detroit Motor Bus Company will be taken up shortly after the holidays. Just what the Mayor's plan will be has not been announced. The bus company is operating in Detroit without a franchise. The one objective strived for, Mr. Lodge stated, is absolute control of the city's transportation facilities, in order that the transportation system be made all exclusive and under the sole authority of the municipal government.

The Mayor stated that it is very evident that the people want an opportunity to express their views as to whether the city should proceed with the so-called dip system or go ahead with the comprehensive subway idea.

## Three Measures for Transit in St. Louis to Be Presented

The Transportation Survey Commission of St. Louis, Mo., on Nov. 21 indorsed three measures to be presented to the Missouri General Assembly when it convenes at Jefferson City, Mo., on Jan. 2. The bills are intended to secure for St. Louis the necessary powers to establish a rapid transit system.

One measure will confer the right to construct subways and elevated tracks for rapid transit and to assess part of the cost against property found to be benefited by the improvements. Another would give the city the right of excess condemnation of property affected by public improvements. Such a measure would speed up the preliminary arrangements for the rapid transit system. A third measure is designed to increase from 20 years to 50 years the limit for which the city may issue bonds. To attain this the Missouri constitution must be amended by popular vote. There is to be a state-wide referendum on this subject.

## Franchise Negotiations Started

**City and company at Akron begin discussions on which to base new grant. Riders interested in quality of service**

NEGOTIATIONS between the city of Akron and the Northern Ohio Power & Light Company for a new franchise based upon the recent report of the citizens' fact-finding committee were begun during the week ended Dec. 8. It is understood that the company will suggest an initial fare of 10 cents with a ticket rate of fare in line with that now existing. The present rate of fare in Akron now is 7 cents cash, four tickets for 25 cents, seventeen tickets for $1.

The company is operating under a temporary franchise which expires on Feb. 15. It is generally recognized that some increase in fare is justified, but the question to be determined is just how much advance should be made with the interests of the city and the company joined. One of the local newspapers, *The Beacon Journal*, suggests that the present cash rate of fare should be continued. *The Times-Press* has refrained from suggesting a rate of fare.

In a statement made public by A. C. Blinn, vice-president and general manager of the company, attention is called to the fact that the company has upon several occasions endeavored to bring about economies suggested by the citizens' fact-finding committee, and the suggestion is made "that it must be borne in mind that the service to the car riders is of first consideration and car riders do not want anything done that will affect the quality of service."

As Mr. Blinn sees it, "there is very little duplication of service, if any, that can be avoided. Where all transportation lines come into the business district, there must be certain duplication on the main thoroughfare or at the point of concentration." He continues:

It should be understood that a reasonable increase in fare does not always result in decreased riding. Akron is one of the very best examples of this fact. In 1925 there was an increase in the number of car riders over 1924, notwithstanding an increase in fare. The constant increase in the popularity of the 10-cent bus lines in Akron is another evidence that a reasonable increase in fare does not decrease the number of riders. Requests have been continually made for additional 10-cent bus lines. Our experience is that the public is primarily interested in good service and is willing to pay for it.

If the fare increases had not helped transportation companies of this country, most of them would be in receivers' hands today.

The report of the fact-finding committee contains a complete survey of the transportation situation in Akron and it certainly removes the subject from demagogic debate, reducing it to a point where the problem may be discussed upon a practical, common sense and business basis.

## COMING MEETINGS OF *Electric Railway and Allied Associations*

*Dec. 10-12* — National Highway Traffic Association, annual meeting, Automobile Club of America, New York, N. Y.

*Jan. 14-18, 1929*—American Road Builders' Association, convention and road show, Cleveland, Ohio.

*Jan. 15-16*—Kentucky Association of Public Utilities, annual meeting, Brown Hotel, Louisville, Ky.

*Jan. 22*—New York Electric Railway Association, mid-winter meeting and dinner, Hotel Commodore, New York, N. Y.

*Jan. 23-25*—Electric Railway Association of Equipment Men, Southern Properties, and Southwestern Public Service Association, Mechanical Division, joint meeting, Houston, Tex.

*Jan. 24-25*—Central Electric Railway Association, Claypool Hotel, Indianapolis, Ind.

*Jan. 25-26*—Central Electric Railway Accountants' Association, Claypool Hotel, Indianapolis, Ind.

*Jan. 28-Feb. 1*—American Institute of Electrical Engineers, annual convention, 33 W. 39th St., New York, N. Y.

*Feb. 7-8*—Midwest Electric Railway Association, Midwinter meeting, Robideaux Hotel, St. Joseph, Mo.

*Feb. 14*—Central Electric Railway Master Mechanics' Association, Youngstown, Ohio.

*Sept. 28-Oct. 4*—American Electric Railway Association, 48th annual convention and exhibit, New Public Auditorium, Atlantic City, N. J.

## Successors to Detroit Jitneys Popular

The de luxe bus system established on Woodward Avegnue on Nov. 25 has proved very popular and the Department of Street Railways has expressed confidence that these buses are more than filling the needs for transportation formerly met by the jitneys. The number of buses has been increased on the Woodward line and on Dec. 1 operation was started on the Grand River Avenue line. More buses are being added to the Grand River line as they are delivered by the manufacturers.

## Rerouting in New Orleans

Important changes in the routes of eight street car lines of the New Orleans Public Service Company are proposed in maps and plans now in the hands of Public Utilities Commissioner William T. Hall, and will be submitted to the Commission Council at the next meeting. The changes were agreed upon after conferences attended by experts of the city and planning and zoning commission, Commissioner Hall, and engineers of Public Service.

## Special Rates on Fredonia Line

A new tariff of the Buffalo & Erie Railway, Fredonia, N. Y., has been approved by the Public Service Commission effective Dec. 26. It provides special car rates between stations on its lines and for round trip transportation of not more than 50 persons per car. The person designated as being in charge of the party will be required to purchase a special car ticket naming the station to and the station from, the rate and the number of persons in party. Such tickets will be good for round trips on the special car.

## Plans for Freight Service Being Perfected

Final arrangements are fast being made for divisions of the Texas Electric Railway between Dallas and Waco, Dallas and Corsicana, and Dallas and Denison to handle freight shipments, of carload and less than carload lots, in interchange with steam railroads with which the three divisions intersect. An hourly schedule of movement and delivery of freight will be observed in the service, in which the latest type of 50-ton electric locomotives will be employed.

The major portion of freight in and out of Dallas will be handled at night by the company. Cars loaded along the lines outside of Dallas, for destination in any section of the United States, will be hauled to the nearest junction point and turned over to the steam road.

More than 230 miles of track belonging to the Texas Electric Railway have been brought under this electrification of freight service, which is the first service of its kind to Texas shippers.

## Another Branch of Pennsylvania Operates Electric Trains

The Pennsylvania Railroad added a link on Dec. 2 to its extensive electrification project when the 6:42 a.m. train from West Chester, Pa., arrived in Broad Street Station under electrical power. The Octoraro branch, the latest to be electrified, follows the tracks of the Wilmington branch as far as Woodlands Cemetery in West Philadelphia, then branches off to Wawa and West Chester. It comes a distance of 27½ miles. Service from Wawa to Oxford and Perryville is being supplied by gas-electric cars, with the exception of one mail steam train daily. The Wilmington branch began electric operation Sept. 29. From three to eight minutes have been cut from the running time.

## St. Louis to Have Services of R. F. Kelker

Rudolph F. Kelker, Jr., senior member of the engineering firm of Kelker, De Leuw & Company, Chicago, has been selected by the Transportation Survey Commission of St. Louis, Mo., to act as its engineer and aid in planning a rapid transit system for the city and its environs. It is believed that the survey will cost approximately $35,000 and that it will take about eight months time for the study to be completed.

Mr. Kelker will examine all previous reports on the transportation and traffic problems of St. Louis and make such additional investigations which may be found necessary. Reports with recommendations will be submitted to the Transportation Survey Commission from time to time. His studies will include street car and bus routing, with recommendations to provide the most efficient routing and co-ordination with the St. Louis plan.

## Growth of One-Man Car System in Indianapolis

Service with one-man cars has just been introduced on the Northwestern Avenue line of the Indianapolis Street Railway, Indianapolis, Ind., bringing the total of subordinate lines thus served in that way to eighteen. With the exception of service on four important trunk lines of the company and three shorter lines, one-man operated cars gradually have been put into use in the last two or three years. Joseph A. McGowan, secretary and acting president of the company, said the one-man cars were being introduced on lines where service had decreased as a matter of economy, so that the character of the service should not be permitted to decline.

Rerouting of street cars will be the next phase of traffic congestion relief to be attacked by the City Council in Indianapolis, Ind. A change in routes of cars of the Indianapolis Street Railway to keep as many as possible off the main thoroughfares and two minor ones are being contemplated with a view to eliminating right turns at congested corners.

## Electrification Saves Small Texas Road

A short electric line in West Texas has been made a paying proposition. This line, the Roby & Northern, now handles passengers, freight, express and mail on regular schedule and according to the last report made by company officials is earning a fair return on the investment.

Yet six years ago the old steam line was about to abandon. Its 5 miles of track were in bad condition and its meager equipment was no better. Citizens petitioned the West Texas Utilities Company, which had built its transmission lines into Roby and was serving the community with light and power, to purchase the line. The purchase was effected and in 1923 a rebuilding program was started, which has resulted in replacements in track, equipment and terminal facilities and, from accounts, successful operation.

## Opinion Recommends Niagara Bridge Investigation

A report has been received by the Niagara Falls, Ontario, City Council from a special committee appointed to investigate the alleged swaying of the Falls View Bridge of the International Railway across the Niagara Gorge at Niagara Falls. The committee recommends an investigation of the span by the Dominion Board of Railway Commissioners, the Queen Victoria Park Commission, the railway and representatives of the state of New York. "We are of the opinion that this swaying is sufficiently pronounced to indicate that the bridge lacks stability in a lateral direction," says the report. It was accompanied by signed and sworn statements from fourteen persons giving their personal experiences in which it was claimed the bridge on occasions had a lateral sway from 18 to 24 in. and that during such periods the railway had deemed it wise to take precautions in regulating the volume of trolley, vehicular and pedestrian traffic.

## Dismissal of Protest Against Philadelphia Fare

The United States Supreme Court dismissed a taxpayer's suit against the Philadelphia Rapid Transit Company, Philadelphia, Pa., on Dec. 4, for want of a substantial federal question. The suit was brought by George Sambor when the company advanced its fare to 8 cents.

The suit was instituted against the railway on behalf of the taxpayers of Philadelphia to enforce the contract of 1907 restricting the fare to 5 cents for 50 years. The refusal of the federal Supreme Court to intervene makes final the action of the United States Court in Pennsylvania in dismissing the case.

## Rapid Transit Issue Revived in Pittsburgh

Some years ago the people of Pittsburgh, Pa., expressed themselves as favoring a start toward a subway system when they approved a bond issue of $6,000,000 for that purpose. But the issue had not been passed before it was realized that $6,000,000 would not even pay for a good beginning. As a result nothing definite has been done. The disposition was to mark time and this attitude continued until the fate of the constitutional amendment to permit the assessment of benefits upon a whole district was known. To the disappointment of advocates of the subway, the vote throughout the state was adverse, and that plan will have to be abandoned for some years to come at least.

As the *Post-Gazette* sees it, this result should stimulate those not in sympathy with the subway to advance their proposals more energetically. In fact, F. L. Duggan, vice-chairman of the Pittsburgh Better Traffic Committee, said the subway suggestion should be abandoned and work started on the widening

of Fifth Avenue as a substitute. In support of his view Mr. Duggan said that "the bus is here to stay while the subway is a thing of the past. Give Pittsburgh a few more wide thoroughfares and we will surpass our sister cities in traffic progressiveness." The *Post-Gazette* says:

There will be no denial that buses have come to stay, but whether they will replace other forms of transportation or merely serve as an auxiliary to them has not been demonstrated.

The subway may be ruled out as too expensive for Pittsburgh, particularly in view of the defeat of the district assessment plan, but widening of the arteries leading to the triangle, without doing anything for the latter, would simply aggravate the downtown situation. To that conclusion every discussion of the subject has pointed for the past twenty years. Possibly it will be found expedient to take some of the surface cars to a subway level within the triangle only and abandon the longer subway proposals linking East End and Northside in favor of widened streets. The important thing at the moment, however, is to bring the subject up again for prompt action—with a view always towards permanent relief, not a mere makeshift that will hardly be completed before it is found to be hopelessly inadequate and unsatisfactory.

## One-Man Car Line Suspends

Service on the Evans Avenue, McKeesport route, of the Pittsburgh Railways, operated at a 3-cent fare, was suspended on Nov. 27. This action followed the adoption of a resolution by the McKeesport Council condemning operation of one-man cars on the route. Thomas Fitzgerald, vice-president of the railway, suggested to the Mayor that the matter be threshed out before the Traction Conference Board. Mr. Fitzgerald stated that the operation of one-man cars was started "only after the most careful consideration of all elements involved in the situation, including that of safety." Only three cars have been withdrawn from service. They provided fourteen-minute service on the Evans Avenue route with a "tripper" car operated during the peak of traffic, giving eleven-minute service. The route they covered is approximately 2½ miles long, and cars are heavily loaded only at noon, when many people take advantage of the 3-cent fare to go home to lunch, and during the rush hours at night.

## Another Festivity in Cleveland

The Cleveland Railway, Cleveland, Ohio, will hold its first annual Christmas party for employees and their families in the Cleveland Public Auditorium on Dec. 19. In addition to everything customarily associated with Christmas parties, there will be an indoor circus.

A few days prior to this activity the railway chorus will sing for inmates of the Soldiers and Sailors Home at Sandusky, Ohio. The chorus is directed by Charles G. Dawe, director of the Orpheus Male Choir, which won first prize in the Welsh National Eisteddfod in 1925.

# Foreign News

## Traffic Co-ordination in London Seemingly Nearer

Co-ordination of all transportation in London has become seemingly nearer through a resolution adopted by the London County Council at an all night session on Nov. 6-7. At present, most of the buses and rapid transit lines in London, with some of the tramways in the outskirts of the city, are in what is known as the "underground group," while the tramways in the County of London are municipally owned. The resolution adopted by the County Council was that steps be taken to enable it to enter into agreement with the Underground Electric Railways and others, for a common management and a common fund. What these arrangements are to be will have to be determined in the future. It is expected that the plan will not involve a change of ownership of the London County Council Tramways as was made to appear in press dispatches to the United States, but simply a direction of the property and a pooling of its earnings. On March 31, 1928, the debt of the London County Council with respect to its tramways was £8,692,987.

## An Idea from Japan

"KIND WEEK" has just been celebrated on the Japanese railways. The Tokio Railway Bureau decided that all porters and other station employees should "wear permanent smiles, put luggage down gently, and bow every time they are addressed." In addition, some 200,000 leaflets were distributed among passengers asking them not to be hard on the railway employees.—*New York World.*

## Guatemala Railway Suspends

Electric railway traffic on the Los Altos Railway, between San Felipe and Santa Maria de Jesus, in Guatemala, has been suspended indefinitely until connection is made at Quezaltenango. There have been numerous accidents on this railway and very little passenger traffic.

## Argentina Tramway Strike Settled

After having been in progress for 33 days, the tramway strike in Rosario, Argentina, has been settled and service resumed. According to the terms of settlement, both sides have made more liberal concessions than they were disposed to consider at the beginning of the controversy. The settlement came as a surprise to many, as serious consideration was being given by the Mayor to commandeering the company's plant and vehicles.

## Presentation to Alfred Baker

The members of Tramways Committee at Birmingham, England, and the chief officials of the department on Oct. 25 entertained at dinner Alfred Baker, formerly general manager of the city tramways, who retired from his post recently on account of ill health. Various complimentary speeches were made, and Mr. Baker was presented with an illuminated copy of a resolution passed by the Tramways Committee bearing testimony to his eminent services. He also received a handsome grandfather chiming clock.

## Wage Reductions in England

Nearly all sections of British railway employees recently submitted to a reduction of 2½ per cent in wages and salaries, in view of depressed traffic. An exception was the case of the staff in railway generating stations and substations and those engaged on high-tension cable work. The railway companies applied to the industrial court to sanction a corresponding reduction in such cases, and the court has decided that the reduction shall be made.

## Proposed Tramway Line in Java

Plans are now under consideration by the West-Java Tramway Syndicate to connect the isolated region lying to the east of the railway, Meester-Cornelis-Buitenzorg, by means of a tramway which would give direct connection with Batavia, Buitenzorg and Krawang.

TRAFFIC DEVELOPMENTS IN ITALY.—The Italian government has decided to electrify the most important railways serving the port of Trieste, with a view to development of traffic. These lines are the Trieste-Campo Marzio-Opicina, the Trieste-Aurisina Opicina, and the Trieste-Centrale Monfalcome.

SUBWAY PLANNED FOR MOSCOW.—Decision has been made by the Soviet to begin construction on Moscow's first subway. The cost is estimated at £2,000,000 and it is expected that the work will be completed in three years with the aid of German and American firms.

RADIO INTERFERENCE IN SWITZERLAND.—Some of the street cars in Berne were equipped recently with a special device to alleviate present interference with radio reception. If these tests prove satisfactory, all cars will eventually be equipped in this way.

# Recent Bus Developments

## Substitution in Poughkeepsie Defined

The Poughkeepsie & Wappingers Falls Railway, Poughkeepsie, N. Y., under a Dec. 3 order of the Public Service Commission, has been authorized to operate buses in place of cars on its tracks on Market Street, South Avenue and South Road in Poughkeepsie to the city line, in Montgomery Street, in Hooker Avenue and in Southeast Avenue.

Approval was also given by the commission for discontinuance of trolley operation between Poughkeepsie and Wappingers Falls. The railway, under an agreement with the board of supervisors, is to sell to Dutchess County for state highway purposes all its rights to the use of land now occupied by its tracks between Poughkeepsie and Wappingers Falls for $150,000.

## Seeks to Discontinue Line in Los Angeles

Application of the Pacific Electric Railway, Los Angeles, Cal., to discontinue its bus service on what is known as the Hyperion Avenue, Silver Lake, Glendale Boulevard Motor Coach Line has been taken under advisement by the Board of Public Utilities. A protest has been filed with the board against discontinuance of the service.

The company sought to discontinue the service May 12, 1926, setting forth that although $5,000 was paid as a subsidy during the first year, it was operated at a loss. People in the district agreed to subsidize the line for two more years. The service was continued over a slightly different route.

J. O. Marsh, general manager of the utilities department, said it was hoped that the district would have filled up so that the patronage would justify further operation of the line without further bonus. The Pacific Electric Railway contends that the line continues to operate at a loss, even with the bonus.

## Buses Succeed Trolleys in Glens Falls

The Hudson Valley Railway lines radiating out of Glens Falls, N. Y., were abandoned on Dec. 1 and were replaced by 24 buses operated by the Hudson Transportation Company. Substitution by bus terminates railway operation which began 38 years ago.

Abandonment of the trolley service leaves about 50 miles of railway to be scrapped, between Glens Falls and Saratoga, in Glens Falls, between Troy, Mechanicville and Stillwater, Lake George and Glens Falls, and Glens Falls through Hudson Falls to Fort Edward.

The successor company will retain about 40 of the 125 employees of the Hudson Valley, a subsidiary of the Delaware & Hudson Company. Several men, in the employ of the railway company for more than 25 years, will retire, while others may be employed by the transportation company later.

## Two-Mile Route in Buffalo Up to Commission

The Buffalo City Council has granted a one-year franchise to the International Bus Corporation, a subsidiary of the International Railway, Buffalo, N. Y., to operate buses in Kensington Avenue from Bailey Avenue to the city line, a distance of almost 2 miles. A 10-cent fare will be charged and the company is required to issue free transfers to other bus and car lines. The route, on which the company will operate single-deck, gas-electric buses, serves a new residential development in the northeast section of the city. The new service will start as soon as the necessary authority is obtained from the Public Service Commission.

## Move to Put Louisville Taxis Under Regulation

The taxicab situation in Louisville, Ky., has not changed in the past two months, other than an ordinance which has passed the lower board of the City Council placing cabs under regulation. It provides for insurance or bond in acceptable concerns, with the $5,000 for one, or $10,000 for two persons hurt in an accident; for carrying on under a $30,000 blanket bond; maximum fare rates of 30 cents for the first quarter of a mile, as against the present 25 cents for two miles or under. The ordinance also provides for meters on all cabs, issuance of receipts and that drivers will have to pass examinations and receive permits from the Board of Safety before they can take out a cab. The latter provisions would block the migration of outside cabs and drivers to the city of Louisville to capitalize on the crowds at the race meets.

There are now about six concerns in the taxi business with two or more cars. One company is now operating Whippet cabs at 8⅓ cents per mile, or 3 miles for 25 cents, but more than 3 miles puts the rate up to 10 cents a mile for additional mileage. Most of the others are operating at 2 miles for 25 cents, or 12½ cents a mile.

The Louisville Taxicab & Transfer Company increased its number of cabs from about 75 in active service and 150 in all, to more than 250 in active service, plus a reserve supply, and all at 12½ cents a mile, having met the price.

## Action on Buses in Kansas City Will Wait Fare Outcome

The Kansas City Public Service Company, Kansas City, Mo., will not ask for a renewal of its bus franchise. Its action on buses will depend on the outcome of the request, before the City Council at this time in which a 10-cent fare is suggested. In the recommendation to the Council, the company promises continuation of the bus service if the new fare is put into effect. Officials plan to ask for a day-to-day agreement with the Council to operate the buses until the increased fare question is settled. The trial agreement with the buses expired on Dec. 1.

In the report presented recently to the City Council by the company, there is little reference to the buses except to say that they are losing money. It stated, however, that if the 10-cent fare is accepted, the bus service will continue.

According to President Groner, bus service is still in the experimental stage and no long-term contract will be made by the company. The situation is further complicated by the fact that much of the equipment will probably have to be replaced within the next year. This applies particularly to the double-deck buses and the heavy coaches which were bought to run on a de luxe route at a 25-cent fare. The company says that the double-deck buses will not be replaced as they have not proved satisfactory.

Although the company reduced the bus fare from 15 cents straight to two fares for 25 cents, the buses are still losing money. They are losing less money than they did at the 15-cent fare, but more than at 10 cents, and under the 10-cent fare they lost money constantly.

## Service by Bus Between Jackson and Kalamazoo

United States District Judge Charles C. Simons has authorized John F. Collins, receiver of the Michigan Electric Railway, to discontinue interurban service on its southern division, Jackson to Kalamazoo. Loss of more than $10,000 on this line from June 19 to Oct. 31 was cited as the basis for the order. Freight service will be continued, and buses will take care of passengers.

## Syracuse Fare Agitated

Tentative plans have been laid to raise the bus fare in Syracuse, N. Y., to 10 cents cash with six tickets for 45 cents, corresponding with the rate of the New York State Railways on trolleys. The program also provides for issuance of a five-year permit for bus operation to the Syracuse Coordinated Railways Corporation, subsidiary of the New York State Railways. In return for the five-year permit and the higher fare, the bus corporation and railway agreed to ex-

tend the bus lines and make other improvements.

The program has been tentatively approved by the aldermanic franchise committee and representatives of the bus and railways as a compromise. The bus company had asked for a franchise for its bus lines. In the past it has been operating under a permit which had to be renewed by the aldermanic body annually. The aldermen as a whole were opposed to the franchise proposition. Railway officials said they would extend the bus lines only on condition that they receive a franchise or long-term permit, which would serve to protect their investment. They contended that it was inconsistent to have the buses operate at a 7-cent fare and the trolleys at a 7½-cent ticket or 10-cent cash fare, particularly in view of the fact that it was possible to transfer from one to the other.

## Geneva-Waterloo-Seneca Falls Route Sought

The Geneva Railway Bus Lines, Inc., applied, on Dec. 4, to the Public Service Commission for a certificate for the operation of a bus line from Seneca and Linden Streets in Geneva, to Main Street in Waterloo town, thence to Seneca Falls. The petitioner also asks for a certificate to operate along Lake Street in Geneva and the continuing highway in Waterloo town to the junction with North Street. In the petition it is stated that the schedules of operation and fares, including round trip commuters and school tickets and transfer privileges, are to be the same as the existing operating schedules and fares of the Geneva, Seneca Falls & Auburn Railroad Company, Inc. The bus line has been operating in Geneva, N. Y., since 1925.

## Equalizes Rail and Bus Fares in Binghamton

An amended tariff of the Binghamton Railway Bus Lines, Inc., has been approved by the Public Service Commission in accordance with an ordinance adopted by the Common Council of Binghamton, N. Y. It authorizes the Binghamton Bus Lines, Inc., to charge the same fare for transportation over its lines within the city of Binghamton as is charged by the Binghamton Railway over its car lines within said city, with universal transfer privileges between buses and street cars. Cash fare is 10 cents with four tickets or tokens sold for 30 cents. The new tariff is effective on Dec. 20, 1928.

## East St. Louis Petition Denied

The application of the East St. Louis & Suburban Railway to substitute buses for street cars between Edgemont and Lebanon, Ill., was dismissed by the Illinois Commerce Commission on Nov. 27.

# Financial *and* Corporate

## North American Company Centralizes St. Louis Operation

The Missouri Public Service Commission on Nov. 28 granted the application of the Union Electric Light & Power Company, St. Louis, for authority to acquire by purchase from its parent, the North American Company, the stock of all the public utilities in the East St. Louis and Alton districts controlled by that company. A total of $18,100,000 is involved in the sale, which simply means that the North American Company is centralizing the operation of all its utilities in the Greater St. Louis district in the Union Electric Company.

The Union Electric Company will pay the North American Company $8,000,000 in cash and $10,100,000 of its common stock. It was stated in the application and testified to at the hearing that the Union Electric is simply paying the North American Company just what it cost that concern to acquire these utilities.

Corporations affected are the East St. Louis Light & Power Company, East St. Louis Railway, Alton & St. Louis Railway, Alton Gas Company, the Alton Railway and the Union Electric Light & Power Company of Illinois, which operates the Cahokia power plant south of East St. Louis.

## Revenue and Traffic Fall Off in Philadelphia

For the nine months ended Sept. 30, 1928, the deficit of the Philadelphia Rapid Transit System, Philadelphia, Pa., was $409,832, for the three months' period ended Sept. 30, 1928, $440,421, and in September, 1928, the deficit was $411,294.

The company in its report states that this deficit represents largely the added expense to P.R.T. system from operation of Broad Street subway. September was the first of three months during which P.R.T. agreed to operate the subway for the city. Terms generous to the city were agreed upon because the management recognized that in no other way could the true financial effect of this city-built subway be shown so as to be accepted and understood by everybody. This understanding has now been secured, the cost will be met out of P.R.T. surplus without affecting dividends, and the city has been notified that a new agreement must be provided for after Nov. 30.

## Investigation Planned of Grays Harbor Holdings

Legal proceedings leading to the acquisition by the city of Aberdeen, Wash., of the Grays Harbor Railway, Light & Power Company have been authorized in a communication from the City Council. This grants Mayor H. E. Bailey the power to employ special counsel and to proceed with the necessary steps to procure the facilities. Whether the property will be acquired through purchase without condemnation was not known today. The Mayor said that it was planned by the city to conduct a complete survey of the holdings of the company, as soon as a definite price was placed on it by company officials.

## Approval Sought for Declaration of Abandonment

The International Railway, Buffalo, N. Y., has applied to the Public Service Commission at Albany for approval of a declaration of abandonment of its double track line in Carolina Street, starting from Niagara Street, alleging that this part of its system is no longer necessary for the successful operation of its lines and has been non-operative for more than five years. Further, the company states the lines using the portion of the route have been rerouted for more than five years past to give more direct and efficient service in the district.

## Puget Sound Sale Postponed

Fixing of the time and place of the sale of the property of the Puget Sound Electric Railway, Tacoma, Wash., used in its operation of the Seattle-Tacoma interurban line, has been delayed for two weeks. Date of sale was to have been set in Federal Judge Cushman's Court on Nov. 25, but he continued the hearing until after Dec. 10, upon request of the receiver's attorney.

PASSENGER STATISTICS FOLLOW:

| | Nine Months Ended Sept. 30, 1928 | | | Nine Months Ended Sept. 30, 1927 | | |
|---|---|---|---|---|---|---|
| | Passenger Revenue | Passengers Carried | Average Rate per Passenger, Cents | Passenger Revenue | Passengers Carried | Average Rate per Passenger, Cents |
| Surface, subway and elevated | $33,666,145 | 648,275,077 | 5.19 | $35,128,281 | 670,097,096 | 5.24 |
| Bus | 2,615,433 | 26,829,001 | 9.75 | 2,197,176 | 23,922,042 | 9.18 |
| | $36,281,579 | 675,104,078 | 5.37 | $37,325,457 | 694,019,138 | 5.38 |
| Taxi | 4,066,620 | | | 4,156,574 | | |
| Total | $40,348,199 | | | $41,482,031 | | |

## Records in Rides and Receipts Registered in Chicago

Street car riding in Chicago, which has shown a remarkable growth throughout the year, reached the highest peak in the history of the city last month, according to the October report of the Chicago Surface Lines, just issued. Both in total rides and in gross receipts the company set a new record.

The total number of rides during the month was 142,063,299, an increase of 2,884,207 over the previous highest month—last March. The gross receipts were $5,406,144, an increase of $58,915 over the previous high of December, 1926. Guy A. Richardson, vice-president, said:

> We are timing overhauling schedules in such a way as to have every car available during rush-hour periods throughout the heaviest part of the Christmas shopping season.

Company officials declare that there has been no unusual condition this year to account for the tremendous increase in riding, and they credit the growing business almost entirely to the greater popularity of street car service. In this connection Mr. Richardson said:

> People are learning more and more that the common carrier has a distinct advantage over the private automobile for city transportation. Surface Lines cars make almost as good time as automobiles in congested sections, and when the time consumed in parking the automobile is taken into consideration, the street car is faster. So far as economy is concerned, of course, there is no comparison. Short-haul riding has been increasing rapidly of late also, due to the increased regularity of cars through the Loop and other congested sections.

## Preferred Stock of Interurban Publicly Offered

Public offering of $1,500,000 of 6½ per cent cumulative Class A preferred stock of the Chicago, South Shore & South Bend Railroad was made on Dec. 1, at $96.50 a share. This is the first stock of the railroad ever offered to the public. It will be sold by employees of the railroad and by the Utility Securities Company, Chicago.

The road is more generally known as the South Shore Line. It is controlled by the Midland Utilities Company, which also controls a number of other utility companies in northern Indiana. The railroad came under the present management on July 14, 1925. Since that time an extensive rehabilitation program has been carried on and service improved.

Under the new management there has been a steady increase in business. Passengers carried on the main line increased from 1,552,308 in 1925 to 2,806,855 for the year ended Sept. 30, 1928, an increase of 80.8 per cent. Passenger revenue rose from $599,236 in 1925 to $1,772,918 for the year ended Sept. 30, 1928, an increase of 195.9 per cent. Freight revenue rose in the same period from $189,263 to $1,129,856, an increase of 497 per cent. Total operating revenue in the same period increased from $858,265 to $2,972,888, or 246.4 per cent.

## Sale of Spartanburg Property Arranged

All the property of the South Carolina Gas & Electric Company will be sold at the Spartanburg County Court House on Dec. 10, under an order by Judge H. H. Watkins of the United States Court of the Western District of that state. The order also named an upset price of $4,200,000. Action which terminated in this order grew out of a suit brought last June and the federal judge upholds a report of the case made by Solicitor J. C. Blackwood, of the Seventh Judicial District, who was appointed special master.

According to the order, the purchaser will "satisfy and discharge any unpaid indebtedness and obligations or liabilities which have been duly contracted or incurred by the company for the necessary operating expenses in due and ordinary course of the said company subsequent to the commencement of this suit."

The South Carolina Gas & Electric Company defaulted on payment of interest on bonds and action followed. The Merchants & Farmers Bank, as trustee for their bondholders, brought action in the United States courts against the gas company to foreclose third mortgages. The New York Trust Company, as trustee for first bondholders, and the American Exchange Irving Trust Company, as trustee for second mortgage bondholders, were made parties to the action and asked that their mortgages be foreclosed in the same proceedings.

Mr. Blackwood was appointed special master to take testimony and determine all points of law and fact, and to pass on all claims against the company and report his findings to the court. He filed a report and recommended the foreclosure of all mortgages and the sale of the property of the company. As said above, this report by the master was upheld by the court.

## Traffic, Fare and Wage Figures

The number of revenue passengers, including bus passengers, reported by 228 companies to the American Electric Railway Association for the month of October, 1928, compared with October, 1927, is as follows:

| | |
|---|---|
| October, 1928 | 839,377,637 |
| October, 1927 | 833,954,392 |
| Increase, per cent | 0.65 |

This is the first month that has shown an increase in traffic since March, 1927, with the exception of February, 1928, when the increase was due to the extra day occurring in Leap Year. While this increase is encouraging it is too soon to say that it is due to any fundamental improvement in traffic conditions, since there were two more full working days in October, 1928, than there were in October, 1927, and it is quite possible that this difference in the calendar may have accounted for the increased traffic in 1928.

Average cash fare in cities of 25,000 population and over:

| | Cents |
|---|---|
| Nov. 1, 1928 | 8.2358 |
| Oct. 1, 1928 | 8.2241 |
| Nov. 1, 1927 | 8.0723 |

The increase in the average fare between Oct. 1 and Nov. 1 was due to an increase in Los Angeles from 5 cents straight to 7 cents with four tokens for 25 cents and an increase in Shreveport, La., from 7 cents straight to 8 cents with eight tickets for 60 cents.

The correction in the average for Oct. 1, 1928, and that shown in last month's service letter is due to the fact that street railway service in Marion, Ohio, with a population of about 28,000, has been discontinued and the city therefore has had to be taken out of the average.

| | Average Hourly Rate, Cents | Index Number 1913 100 Per Cent |
|---|---|---|
| Nov. 1, 1928 | 57.52 | 211.08 |
| Oct. 1, 1928 | 57.52 | 211.08 |
| Nov. 1, 1927 | 57.29 | 210.24 |

## New Director in Boston

Bernard J. Rothwell, president of the Bay State Milling Company, has been elected a director of the Boston Elevated Railway, Boston, Mass. Mr. Rothwell's appointment comes as the result of the directors' decision to increase their number by one. Mr. Rothwell was president of the Boston Chamber of Commerce from 1908 to 1910, and in 1913 served as chairman of the Massachusetts Commission on Immigration. He is prominently connected with many enterprises.

## David F. Houston Elected to Brooklyn Board

David F. Houston, former Secretary of Agriculture and of the Treasury and now president of the Mutual Life Insurance Company, New York, has been elected a director and member of the executive committee of the Brooklyn City Railroad, Brooklyn, N. Y., to succeed the late James Simpson.

## Bringing the Force Together in Baltimore

The United Railways & Electric Company, Baltimore, has leased six entire floors in the new Court Square Building and will move its offices from the Continental Building about March 1. At the present time the offices of the Baltimore company are scattered over a number of floors of the Continental Building, some on every floor from the eighth to the fifteenth. In addition to these the company uses one complete floor.

# Book Reviews

## Stay Alive!

Marcus Dow. Published by Marcus Dow, Inc., New York, 209 pages. Price $2.

Kicks enough to go around for all walking and riding humanity are contained in Marcus Dow's message "Stay Alive!" Through his spokesman, Jim the truckman, observant and experienced, many harrowing tales are recounted with such vividness and conviction that the reader can't help but agree with this burly recorder that the question of accidents is all a matter "of usin' the noodle." To prove his contentions Jim recites one instance after another—backing without looking behind, rushing past intersections and piloting with one arm—where results might very evidently have been different.

The three or four line admonitions at the end of each chapter epitomize the substance of the kick in that particular chapter. Corner Cutters, for instance (Kick No. 20), points this moral: "Turnin' a corner faster than anybody can walk in givin' them that walks a kind of a tough break." Another, called Black Cats, suitably listed as Kick No. 13, ends thus: "Don't try to hug the car in front o' you. Wait till you get home and hug your wife."

Nor is Jim biased in favor of the pedestrian. He often finds the walking human a more perverse goat-getter. In language that certainly is not euphemistic he scores the jay-walker who steps unwittingly, of course, in front of a touring car, taxi or truck and the fellow who for a capricious reason decides to cross the avenue green lights or otherwise. Besides, Jim believes that this hurry business is an illusion.

Again, Jim claims many drivin' fools really think "they is good engineers," but he knows better. For he had a career shunting box cars in the main yard of a terminal on one of the big transportation lines of the country and there he learned his lesson on the how, why and wherefore of care and safety.

Mr. Dow, the author, is one of the leaders of safety in this country with activities in the field of public service that cover fifteen years and embrace the writing of valuable pamphlets, making public addresses and moving pictures and otherwise giving his time and energy to the business of saving life.

Jim's cracks on the shortcomings of "drivin' fools and walkin' yaps" and the drawings of H. S. Zoll might be examined with profit by all drivers.

## Law and Practice

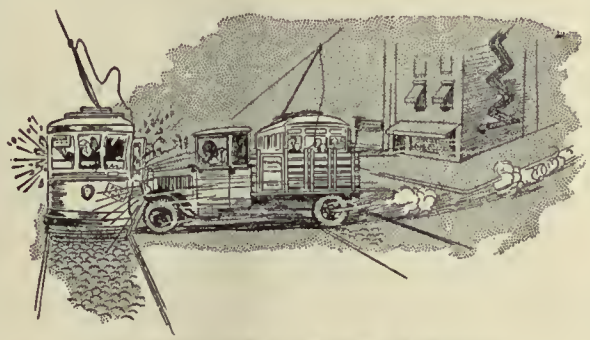
Oscar A. Gier. Published by Richards & Gier, patent attorneys, New York. No charge.

This is a summary of United States patent law, relating to the prospective patentees, what may be patented, methods of applying for a patent, procedure in the patent office and infringement suits. The appendix gives the rates charged for foreign patents, term of patent and other similar information.

## Public Utility Rate Making

Taylor E. Groninger, Bobbs-Merrill Company, Indianapolis. 381 pages. Price $7.50.

The author was formerly corporation counsel for the city of Indianapolis and special counsel for the Indiana Public Service Commission. He was also one of the attorneys in the Indianapolis Water Case, before the Public Service Commission of Indiana, before the United States District Court, and finally, before the United States Supreme Court, where he made one of the oral arguments. This experience qualifies him for a discussion of the subject. In his introduction he says frankly that though he would prefer that the rate base should be measured by "prudent investments," he discusses all the methods approved by the courts. Besides treating the points usually considered in volumes on this subject, the author adds several appendices, giving many details of recent cases, revised rules of the Supreme Court of the United States and other pertinent matters.



Drivin' with bum brakes is a cruel crime against humanity.

## Mundy's Earning Power of Railroads

Compiled and edited by Floyd W. Mundy, James H. Oliphant & Company, New York, N. Y.

In this 23rd issue are found important statistics and other facts relating to the earning power and to the securities of railroads, arranged in convenient form for ready reference. Such subjects as stocks, funded debt, mileage, revenues, rentals, guarantees, investments, valuations and others are covered so that the investor can inform himself on the value of the stocks and bonds of any important railroad in the United Sates. Official annual railroad reports have been used almost exclusively in the preparation of this book.

## Whither Mankind

Edited by Charles A. Beard—Longmans, Green & Company, New York, N. Y. 408 pages, Price $3.

Not so much to defend the machine age as to urge an impartial and dispassionate view of its accomplishments and possible future, "Whither Mankind"—a panorama of modern civilization—will give the inquiring mind some pertinent facts on life as it is lived today. Dr. Beard and his collaborators have dissected and analyzed the machine age and have tried to answer its assailers and critics on the esthetic, religious and humanitarian sides.

Certain contributions to this symposium are not connected with electric railway enterprises. However, the discussion on business by Julius Klein, director of the U. S. Bureau of Foreign and Domestic Commerce, is not too far afield to win the attention of the progressive transportation man. To Dr. Klein it would appear that after passing through its successive stages, "machinery and its directive force, modern business," have made an impressive contribution in "easing the burdens of drudgery, in sharing the costs of countless tasks, and in making available a larger leisure for the enjoyment of those finer comforts which in earlier ages were the exclusive prerogatives of a few." He sees business, too, with a grave responsibility in the drama of restoring order out of post-war chaos.

A particularly provocative chapter on education has been written by Everett Dean Martin, containing generous excerpts from his "The Meaning of a Liberal Education." Just as the latter work is worth the time of every railway manager and operator, now vitally interested in the problem of educating the rank and file, so, too, might this addenda be read with profit by all in and out of the railway field who are floundering about in an effort to know and apply the aim of education to modern conditions.

## The New Way to Net Profits

Fred W. Shibley, New York. Harper & Brothers. 206 pages. Price, $3.

This book on the science of business is a practical treatise dealing with the making of net profits in business and industry. The appeal of the book's contents should be a wide one. Manufacturers, merchants and bankers will find information of great value in the solution of their special problems.

The opening chapter on "Why the New Way Was Found Necessary," establishes the fact that the present is the day of the thinker, the philosopher in industry. Modern business has become highly complex and must be conducted on scientific principles. In consequence the business man today must possess the intellectual qualifications and the practical wisdom of a philosopher if he expects to attain pre-eminence.

# Personal Items

## George B. Avery Takes Over the Reins in Seattle

The appointment of George B. Avery as superintendent of public utilities of Seattle, Wash., by Mayor Frank Edwards, on Aug. 15, last, was followed on Nov. 13, by the City Council passing an ordinance giving Mr. Avery full charge of the Seattle Municipal Street Railway department and abolishing the position of general superintendent, held by David W. Henderson, who died on Oct. 27. Mr. Avery, as superintendent of public utilities, succeeds Clark B. Jackson. In line with his expressed policy of operating the system as a corporation would operate it, he has appointed the following heads of departments for the railway:



George B. Avery

Roy E. Furse, superintendent of transportation; R. E. Pierce, superintendent of maintenance; A. D. Campbell, superintendent of equipment and A. C. Hiatt, accountant.

Prior to his appointment, Mr. Avery was employed by the State Department of Labor and Industries at Olympia, having charge of six counties, including King County, the largest of the 39 comprising the state. He also has been identified with the Internal Revenue Department, operating in Seattle and for about eight years served the government as an electrical engineer, supervising electrical installations in hospital construction programs in South Dakota and elsewhere.

Mr. Avery was born in Chariton, Lucas County, Iowa, on March 19, 1884. He went to Seattle in 1916 and has been active in civic affairs.

Mr. Avery signalized his advent into full power over the municipal railway by launching energetic steps on his program, which promises improvement in service as well as heavy reduction in operating costs. He declared that hereafter "efficiency, service, economy and courtesy" would be the rule of the railway department.

As the first step in this program, Mr. Avery plans to speed up service in the congested downtown district during the afternoon "peak" traffic rush. To this end, police department has started strict enforcement of a ban on parking of automobiles. Further, to expedite movement of cars in the downtown district, fares will be collected at both front and rear doors, that loading may be more quickly accomplished.

After Jan. 1, the feeder buses will be retained and one-man cars will be operated on all lines, except that two-man cars will be in service on certain of the more heavily traveled lines during the late afternoon rush period. Carrying out instructions, Roy E. Furse, superintendent of transportation, has issued a bulletin to the 1,100 train men on two-man cars warning them of the impending change to a one-man car basis, and advising them to familiarize themselves with the one-man car operation before Dec. 15. After that date, selection based on efficiency will be made of the 1,000 who are to be retained as one-man car operators.

## M. R. Beaman Honored in Philadelphia

Maurice Regan Beaman has been appointed secretary of the Bureau of Transportation and Commerce, recently established by the Philadelphia Chamber of Commerce. For more than a year the holder of this new post has been general manager of the Camden Marine Terminals and traffic manager of the South Jersey Port Commission. He has spent more than a score of years in handling transportation problems, half of the time in the service of the carriers and the rest either with the shippers or in port executive positions in various cities.

For twelve years until 1915 Mr. Beaman was with the traffic department of the Southern Railway. He developed into a rate expert, appearing frequently before the Interstate Commerce Commission. In Camden he organized the Traffic Club and reorganized and headed without compensation the traffic committee of the Camden Chamber of Commerce.

Mr. Beaman was born in Raleigh, N. C., 41 years ago. He was graduated from the old Columbia Law School in Washington. In his new post he will combine into one bureau the work formerly handled by the transportation bureau and the foreign trade bureau of the chamber. P. H. Gadsden, president of the chamber and a former president of the American Electric Railway Association, in announcing it said that Mr. Beaman's appointment was the first of a number of important developments intended to increase the militancy of the Chamber of Commerce.

## Additional Duties for D. W. Dodge of Brill

Douglas W. Dodge, who has represented the automotive car division of the J. G. Brill Company since 1923, has also been appointed Pacific Coast representative of its electric car and truck division. Therefore, in addition to self-propelled gas-rail and gas-electric cars for steam railroads, Mr. Dodge will also handle the sale of electric cars, trucks, seats, specialties and renewal parts in the states of Washington, Oregon, California, Idaho, Utah, Arizona, Montana, Wyoming and Nevada. His office will continue to be in the Rialto Building, San Francisco.

A broad engineering experience was acquired by Mr. Dodge with the Ocean Shore and the Western Pacific Railroads, as well as the Pacific Portland Cement Company. From 1907 to 1917 he was engaged in sales work for the Orenstein Arthur Koppel Company. Then for two years he served in the Engineers Corps, U. S. Army.



D. W. Dodge

Subsequently, he was Pacific Coast manager of the Lakewood Engineering Company and manager of the Engineering Products Company, representing the latter until his recent appointment.

Mr. Dodge, who has always lived on the Pacific Coast, is a member of the Engineers, Transportation and Commercial clubs and of the Menlo Country Club.

## Messrs. Kidd and Murrin in New Rôles

George Kidd has resigned as president of the British Columbia Electric Railway, Vancouver, B. C., and has accepted the chairmanship of the board of directors of the British Columbia Power Corporation, the holding company. W. G. Murrin, vice-president, will take over the office of chief executive.

Mr. Kidd thus completes a period of fifteen years as head of the British Columbia utility. He was educated as a chartered accountant and was ap-

pointed (London, England) secretary of the British Columbia Electric Railway in 1907. Four years later he went to British Columbia and acted as comptroller until May, 1914, when he was appointed general manager. The office of general manager was changed to that of president in August, 1923.

Mr. Murrin began his public utility career in the City of London Electric Lighting Company in 1903. Later he became works manager and electrical engineer of the London United Tramways, which concern he left in 1913, going to British Columbia as mechanical superintendent of his present company. From general superintendent he became assistant general manager in November, 1916, and was appointed vice-president in August, 1923. The president-elect, as is his predecessor, is well-known in social circles in Vancouver.

## G. W. Schwaner Succeeds R. V. Prather

George W. Schwaner, former Sangamon County treasurer and at one time internal revenue collector, has been appointed secretary of the three Illinois state utility associations, succeeding the late R. V. Prather of Springfield, Ill. This selection was made by executive committees of the three organizations: the Illinois Electric Association, Illinois Gas Association and Illinois Street Railways Association. His office will be in Springfield.

## C. F. Terrell Succeeds E. S. Fitz at Beaumont

E. S. Fitz, operating manager of the Eastern Texas Electric Company, Beaumont, Tex., since December, 1924, has accepted a position with the Virginia Electric & Power Company with office in Richmond, Va. His business connection with Stone & Webster began in 1911 with his employment in the meter department of the Blackstone Gas & Electric Company, Pawtucket, R. I. He has served with the Houghton Electric Light Company and the Houghton County Traction Company. Mr. Fitz was graduated from Brown University, Providence, R. I., as an electrical engineer. Except for the period when he was in the Army Air service overseas, he has been connected with Stone & Webster since 1911.

Mr. Fitz's successor, Charles F. Terrell, has already assumed his new duties as operating manager of the properties. He was formerly general superintendent of the light and power department of the Tampa Electric Company. Beginning work with the Stone & Webster interests in Seattle and later being affiliated with the properties in Bellingham and El Paso, his record of twenty-five years service with the organization is one of steady promotion. Mr. Terrell was born in Illinois in 1885, and he was graduated from the University of Washington as an electrical engineer in 1910.

## A. W. Thompson Away on Leave from U.G.I.

Granting of a six-month leave of absence was voted on Dec. 5 by the United Gas Improvement to its president, Arthur W. Thompson, for reasons of health, and John E. Zimmermann, president of Day & Zimmermann, engineers, received full executive powers temporarily. In the light of the action of Dec. 5 the reason for the addition of five members to the executive committee last month with its implication of a pending consolidation, was said to be clearer. Several New York and New Jersey men were added to the committee.

The new members named were Thomas N. McCarter, president of the Public Service Corporation of New Jersey; William C. Dickerman, operating vice-president of the American Car & Foundry Company; Landon K. Thorne, president of Bonbright & Company, Inc.; Harold Stanley, a member of J. P. Morgan & Company, and Mr. Zimmermann.

The official statement of the change said that Mr. Zimmermann had agreed to accept such a temporary assignment of duty, upon condition that he is not committing himself, nor is the company committing itself by reason of such appointment, to any permanent use of his services as an executive officer, he being unwilling to accept any such obligation.

Mr. Thompson has had a varied and conspicuously successful career in railroad and public utilities fields. He has been president of the United Gas Improvement Company since 1922 and for seven years previously was president of the Philadelphia Company, Pittsburgh. To accept that post he resigned as vice-president of the Baltimore & Ohio Railroad in charge of operations, traffic, engineering and commercial development. He was born in Erie, Pa., in 1875, is a graduate of Allegheny College, and is now president of its Board of Trustees. He is a director of many companies, among them the Pennsylvania Railroad, Missouri-Kansas-Texas Railroad, Philadelphia National Bank, Pittsburgh Hotels Company, Public Service Corporation of New Jersey, Union Trust Company of Pittsburgh, The Pennsylvania Company and the P. C. C. & St. L. Railroad, and is a manager of the Girard Trust Company, Philadelphia.

C. B. Melton, assistant treasurer of the Eastern Texas Electric Company, Beaumont, Tex., has resigned. He has gone to Greensboro, N. C., to take charge of the accounting work connected with the extensive ice properties of the Southern Public Service Company in Virginia, South Carolina and Georgia. He has been a member of the Stone & Webster organization for about a dozen years, serving in Pensacola, Houston and Beaumont.

J. R. Groves has resigned as general manager of the Barrow, England, Tramways on account of ill health. He has had a wide tramway experience during the past 40 years, holding important positions in Edinburg, Cardiff, Yarmouth, Peterborough, Worcester, Gravesend and Barrow. The Barrow Town Council has granted Mr. Groves a pension.

## R. B. Stearns Retires

Robert B. Stearns, vice-president, general manager and treasurer of the Eastern Massachusetts Street Railway, Boston, Mass., who for more than eleven years has been the chief executive officer of the road, has resigned to take effect Jan. 15, 1929. He will continue as a director of the company. The effective date of his resignation coincides with the date of expiration of the ten-year public trusteeship.

# OBITUARY

One of the leading figures of the South, a banker and public utilities projector—E. W. Robertson—died in New York on Nov. 21, after coming to the city to attend a meeting of the directors of the Equitable Life Assurance Society. The former chairman of the board of directors and treasurer of the Columbia Railway, Gas & Electric Company, Columbia, S. C., and the Parr Shoals Power Company and president of the Columbia Gas Light Company severed his connection with these utility enterprises in 1924 at the age of 61. He had obtained control of the Columbia Electric Street Railway, Light & Power Company in 1903 and the name was subsequently changed to the Columbia Railway, Gas & Electric Company. Mr. Robertson was graduated from Yale University and from the law department of the University of South Carolina in 1887. He has been an outstanding figure in banking in the South.

Frederick Kent Copeland, president of the Sullivan Machinery Company since 1892, died at Claremont, N. H., on Nov. 10. After several years spent in Iowa and Colorado in mining engineering work he helped to organize the Diamond Prospecting Company in 1884 and became its president. This company engaged in contracting with the Diamond Core Drills made at Claremont, N. H., by the Sullivan Machine Company. In 1892 the two companies were merged with Mr. Copeland as president. Under his leadership Sullivan products were developed for a wide range of purposes serving the mining, quarrying, constructing and manufacturing industries, being manufactured at plants at Claremont, N. H., and Michigan City, Ind., and marketed through world-wide sales organization. Mr. Copeland was born in Lexington, Mass. He was graduated from Massachusetts Institute of Technology in 1876 and was a member of many engineering societies.

# Additional Improvements Projected

**Pacific Electric may make extensive track changes. Chicago Rapid Transit to improve Westchester line. Tacoma to ask for bids on cars. Seattle and Milwaukee plan improvements**

PERHAPS the outstanding plan among the numerous improvement projects announced this week is that of lowering the tracks of the Pacific Electric Railway, Los Angeles, Cal., that bisect the entire city of Beverly Hills. These tracks, which are at a considerable elevation, will be reduced to street level and many of the wig-wag bell signals will be disposed of, if the Chamber of Commerce and the City Council succeed in an engineering survey that will present an equitable bond issue for the approval of the voters. The railway at its present elevation rises from the surrounding level at the eastern end of Beverly Hills and returns to this level a little beyond the junction of Wilshire and Santa Monica Boulevard, thus making Santa Monica Boulevard an imaginary barrier between the northern and southern sections of the city.

### Chicago Improvements

The Chicago Rapid Transit Company, Chicago, Ill., will make extensive improvements at the present terminus of the Westchester line in connection with the widening and paving of Roosevelt Road. To eliminate the danger of a grade crossing the plans provide for the raising of the highway to a height of 8½ ft. above the present grade and the depression of the tracks of the Westchester line to a depth of 14 ft. The depression of the tracks will be below the sewer level at the lowest point, which will necessitate the installation of a pumping station.

The open cut for the tracks will be 2,300 ft. in length, and a total of 3,800 cu.yd. of dirt will have to be excavated. The present station will be moved south and east and an island platform built in the open cut between the tracks. The work will be done simultaneously with the widening of Roosevelt Road so that the dirt can be taken out of the cut and used for raising the level of the highway across the viaduct.

### To Ask Bids on Cars

The plan for purchasing seven new street cars for the Tacoma Municipal Railway, Tacoma, Wash., has been changed. Instead of buying the cars from an Eastern concern direct, the board of contracts and awards will issue a call for bids for this equipment. The date for calling these bids has not been set. This equipment will be used in place of rented cars, which have been in service since the fire last June that destroyed the carhouse and the rolling stock. The plan for financing this new rolling stock and a new carhouse by a $140,000 utility bond issue was announced in the Aug. 25 issue of the JOURNAL.

The Seattle Municipal Railway has authorized the remodeling of 72 two-man cars to permit one-man operation. Plans for rehabilitating its line and restoring adequate service have been made. These plans involve refinancing, the purchasing of new rolling stock, the rebuilding of the existing system and the construction of needed extensions. The details have not been made public.

### New Station for Milwaukee

A contemplated improvement costing more than $100,000 has been announced by the Milwaukee Electric Railway & Light Company, Milwaukee, Wis. It is planned to erect a sheltered loading station for interurban cars near the Broadway ticket station of the company at Waukesha, Wis. The plans provide for the widening of Broadway from 66 ft. to 102 ft., the erection of a sheltered station of concrete and steel foundation, glass inclosed, over the double tracks and a 22-ft. subway leading to both sides of the street so passengers will not have to cross in traffic. Paving the street and widening the bridge across the Fox River will also be included in the project, at the expense of the railway.

The orders for equipment have dropped considerably. The Washington Railway & Electric Company, Washington, D. C., has purchased during the past month 200 pairs of joint plates, section 114-480; 100 pairs of joint plates, section 104-396; 470 cast-iron manholes, frames and covers and 10,500 track bolts. This company also has purchased three Champion snow plows from the John T. Lewis Company, and among its shop equipment ordered is one Argyle Titan electric drill and one Feregen three-way wheel aligner. The Denver Tramway Corporation has placed orders for 100 30-ft. Western red cedar poles, 41 marathon trolley ears 12 in. long for No. 00 round trolley wire.

### Rolling Stock Ordered

The Northwestern Pacific Railroad, San Francisco, Cal., has ordered five motor cars and five trail cars from the St. Louis Car Company. Mention of the inquiry for these cars was made in the Oct. 27 issue of the JOURNAL.

One interurban car valued at $12,500 was destroyed and a second interurban and four city cars were damaged in a fire in the carhouse of the Kentucky Traction & Terminal Company, Lexington, Ky. The damage to the second interurban car was estimated at $4,000. The damage to the four city cars will approach from $3,000 to $4,000.

The Detroit Street Railway, Detroit, Mich., has purchased fifteen urban-type Twin Coaches from the Twin Coach Corporation at Kent, Ohio. The United Electric Railways of Providence, R. I., has ordered eight suburban express Twin Coaches, and the Boston Elevated Railway, Boston, Mass., has purchased five gas-electric Twin Coaches. The Central Transportation Company, Trenten, N. J., controlled by the Trenton & Mercer County Traction Corporation, has purchased two suburban express Twin Coaches.

## 120 Buses for Detroit

Orders have been placed by the Detroit Department of Street Railways with the Dodge Brothers division of the Chrysler Corporation for 120 Graham Brothers parlor coaches.

Each coach seats fifteen passengers, exclusive of the driver, in individual deep leather, air cushion, wicker chairs on spring bases and is roomy and comfortable. There are four seats at the rear of the bus, one over each rear set of wheels, facing in, six arranged in pairs on the left and three single seats on the right. Ventilation facilities, including an electric fan opposite the door, and ventilators in cowl and roof insure a steady flow of fresh air. The heating is taken care of by the fan blower system, the air being brought in, heated and forced through the coach. A sloping one-piece windshield has V-type ventilating wings at each side as well.



**Each new Detroit bus seats fifteen passengers, exclusive of the driver**

Lockheed hydraulic four-wheel internal expanding brakes with a hand brake which operates on the propeller shaft, an emergency door at the rear

of the coach, and a non-skid entrance step are included in the safety features. A suggestion of the Pullman car is given by the mirrors set in the window posts.

Six-cylinder motors with four-speed transmission provide the power, while the coach has the protection of the braking facilities in an automobile. Freedom from driving strain is assured by the nut-and-lever type steering gear, the varying ratio giving rapid action in turning and easy control on straight-away running.

The interiors are trimmed with leather and all windows are plate glass with roller anti-rattlers inside and out. Stops are signalled by a cord attached to a buzzer in place of the customary push button.

The bus is 20 ft. 6 in. long and 6 ft. 5 in. wide, equipped with four hydraulic shock absorbers and balloon tires with dual rear wheels. The oak flooring laid crosswise is covered with linoleum and 6 candlepower flush type dome lights furnish the illumination.

A distinctive color combination is used by the Street Railways Department, distinguishing the de luxe bus from others operated in Detroit. Around the base of the body is a skirt of black, then a wide strip of maroon topped by a red band set off by black and gold stripes and a beige top. The wheels are red, surmounted by black fenders.

## Manitoba Line Nearing Completion

Construction on the railroad to Seven Sisters Falls—one of the shortest railways in Canada—will be completed early in December and will usher in a new period of hydro-electric development in Manitoba. It will also open up an important agricultural area and a realm for sportsmen.

This railroad is being constructed by the Manitoba Eastern Railway, a subsidiary of the Winnipeg Electric Company. It commences at Whitemouth on the east main line of the Canadian Pacific Railway, 61 miles from Winnipeg and goes north approximately 14 miles to Seven Sisters Falls on the Winnipeg River, the site of the new power plant to be erected by the Northwestern Power Company, Limited. It will be a standard gauge modern railroad capable of handling heavy freight and passenger traffic.

The main purpose of the railway is to provide direct transportation facilities, via the Canadian Pacific Railway, from Winnipeg to the new Seven Sisters power plant, but it will also be a valuable asset to the surrounding district including a rich agricultural territory.

With the completion of the railroad, work will proceed rapidly on the Seven Sisters power plant. This plant will have an initial capacity of 135,000 hp. and an ultimate capacity of 230,000 hp. Construction of the plant will cost approximately $20,000,000 and provide employment for 1,500 or 2,000 men for two or three years.

## Locomotives Purchased by Two Railways

A duplicate 60-ton locomotive has been purchased by the Niagara Junction Railway, Niagara Falls, N. Y., from the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa. This locomotive will be equipped with four 308-D-5 motors and HL control and is the second locomotive of this type being used by this railroad. The Niagara Junction Railway handles practically all transfer traffic between the important chemical factories along the Niagara River and the steam lines.



**The type of locomotive purchased by the Niagara Junction Railway is equipped with four 308-D-5 motors and HL control**



**A 50-ton locomotive of this type has been ordered by the Waterloo, Cedar Falls & Northern Railway**

A 50-ton, class B-1 locomotive has also been ordered by the Waterloo, Cedar Falls & Northern Railway, Waterloo, Iowa. This is an additional locomotive to the four that are operated by the Waterloo road, all of Westinghouse manufacture. The equipment consists of four type 562-D-5 motors, 16 notch "Alf" control, 14-EL air brake equipment, two 35 cubic feet compressors, together with blower equipment. There are approximately 70 of this type of locomotive in service in all parts of the country.

## Profits of 392 Companies Up 10.99 Per Cent

Total net profits of 392 companies, in 21 lines of industry and miscellaneous, amounted to $2,268,106,000 in the first nine months of 1928, compared with $2,043,491,000 in the corresponding period of 1927, an aggregate gain of 10.99 per cent, according to a compilation prepared by Ernst & Ernst, accountants, from published financial statements.

Industrials lead the list with an increase of 19.17 per cent. Public utilities follow with a gain of 11.97 per cent. A group of 125 railroads report an income, before certain charges, but on a comparable basis, 3.02 per cent higher than in the same nine months of 1927.

## Weekly Business Conditions

Industrial production, as reflected by the activity in steel plants, was greater during the week ended Dec. 1, than in either the preceding week or the corresponding period of last year, according to the weekly statement of the Department of Commerce. Petroleum production during the latest week was greater than in either the previous week or the same period of last year. Lumber output, though showing a gain over the previous week, was smaller than in the same period a year ago. Bituminous coal output was larger during the last available week than in either the preceding week or the corresponding period of 1927.

The general level of wholesale prices showed no change from the preceding week, but was about 1 per cent higher than a year ago. Prices for iron and steel showed practically no change from the preceding week, but were higher than a year ago. The wholesale price of copper showed no change over the previous week, but was almost 15 per cent higher than a year ago.

Loans and discounts of Federal Reserve member banks reached a new high point during the week. Interest rates on time money showed no change from the preceding week, but were consider-

WEEKLY BUSINESS INDICATORS

(Weeks Ended Saturday. Average 1923–25—100)

| | 1928 | | | | 1927 | | | |
|---|---|---|---|---|---|---|---|---|
| | Dec. 1 | Nov. 24 | Nov. 17 | Nov. 10 | Dec. 3 | Nov. 26 | Nov. 19 | Nov 12 |
| Steel operations | 109.2 | 106.6 | 109.2 | 113.2 | 87.0 | 91.0 | 88.0 | 87.0 |
| Bituminous-coal production | ..... | 112.6 | 112.1 | 108.2 | 92.9 | 90.6 | 102.6 | 97.0 |
| Lumber production | ..... | 90.9 | 86.8 | 90.0 | 102.3 | 96.4 | 104.5 | 105.5 |
| Petroleum production (daily average) | ..... | 120.3 | 119.6 | 119.9 | 119.1 | 119.9 | 118.4 | 118.5 |
| Building contracts, 37 states (daily average) | ..... | 113.4 | 85.1 | 104.0 | 102.4 | 120.1 | 133.1 | 102.8 |
| Price iron and steel, composite | 87.3 | 87.4 | 86.8 | 86.5 | 85.0 | 85.1 | 85.4 | 85.6 |
| Copper, electrolytic, price | 114.5 | 114.5 | 114.5 | 114.5 | 100.0 | 98.6 | 97.8 | 95.7 |
| Interest rates, time money | 160.0 | 160.0 | 160.0 | 160.0 | 97.1 | 97.1 | 97.1 | 94.3 |
| Federal Reserve ratio | 84.3 | 88.3 | 87.0 | 89.9 | 91.9 | 92.8 | 91.4 | 94.3 |

ably higher than at this time a year earlier. Prices for stocks made a new record during the week, while brokers' loans were higher than at any other previous time. Interest rates on call loans were higher than in either the previous week or the same week of last year. Bond prices, reflecting higher interest rates, were lower than in either the preceding week or the same period of 1927.

## Cleveland Terminal to Have Largest Automatic Substations

The substations of the Cleveland Union Terminal Company, which is equipping the electric zone around the new Cleveland terminal, will be the first in the United States to use 3,000-volt direct current automatic control. Each motor-generator set will be of 3,000-kw. capacity so as to provide sufficient power for the heavy main line movement of passenger trains through the city of Cleveland. The substations, then, will also be among the largest of any railway units automatically controlled. In addition to savings in the cost of operation, automatic switching apparatus also furnishes additional protection which is not ordinarily obtained with manual operation of substations.

## Mazda Lamp Prices Drop

President Gerard Swope of the General Electric Company, Schenectady, N. Y., announced Dec. 1, a further reduction in the prices of popular type automobile and flashlight lamps. This reduction averages 8 per cent on the types affected.

This price reduction on miniature lamps is the tenth since 1920. Today's prices of Mazda miniature lamps are 52 per cent under the 1914 prices.

The following price changes were made:

| | Old Price | New Price |
|---|---|---|
| Mazda 1 | $0.10 | $0.09 |
| Mazda 1110 | 0.29 | 0.27 |
| Mazda 1129 | 0.27 | 0.25 |
| Mazda 1130 | 0.27 | 0.25 |
| Mazda 1158 | 0.28 | 0.26 |
| Mazda 81 | 0.16 | 0.13 |
| Mazda 82 | 0.16 | 0.13 |

## Largest Electric Railway Exports to Brazil

Of the $212,382 worth of railway motors, electric, mining and industrial locomotives, starting and controlling equipment for electric railway and vehicle motors, railway signals, switches, etc., exported from the United States during the month of September, 1928, Brazil received $96,529 worth of this equipment. Of these exports to Brazil $83,929 was for railway motors and $12,600 was for starting and controlling equipment.

Canada received $48,827 worth of equipment which was divided as follows: Railway motors, $8,170; locomotives, $5,054; starting and controlling equipment, $2,944; railway signals, switches and attachments, $32,659. Japan received $39,273 worth of starting and controlling equipment and $8,800 worth of railway motors.

The classification of the total exports of the United States consists of railway motors, $100,899; electric locomotives, $13,391; mining and industrial locomotives, $3,085; starting and controlling equipment for electric railway and vehicle motors, $58,020; railway signals, switches and attachments, $36,987. The total exports of this equipment for September nearly doubled those of August, which amounted to $106,692.

## METAL, COAL AND MATERIAL PRICES F.O.B. REFINERY

| | Dec. 4, 1928 |
|---|---|
| **Metals—New York** | |
| Copper electrolytic, cents per lb. | 15.775 |
| Copper wire, cents per lb. | 17.875 |
| Lead, cents per lb. | 6.5 |
| Zinc, cents per lb. | 6.7 |
| Tin, Straits, cents per lb. | 52.5 |
| **Bituminous Coal, f.o.b. Mines** | |
| Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons | $4.375 |
| Somerset mine run, f.o.b. mines, net tons | 1.875 |
| Pittsburgh mine run, Pittsburgh, net tons | 1.80 |
| Franklin, Ill., screenings, Chicago, net tons | 1.425 |
| Central, Ill., screenings, Chicago, net tons | 1.15 |
| Kansas screenings, Kansas City, net tons | 1.625 |
| **Materials** | |
| Rubber-covered wire, N. Y., No. 14, per 1,000 ft. | $5.5 |
| Weatherproof wire base, N. Y., cents per lb. | 18.625 |
| Cement, Chicago net prices, without bags | 2.05 |
| Linseed oil (5-bbl. lots) N. Y., cents per lb. | 10.6 |
| White lead in oil (100-lb. keg), N. Y., cents per lb. | 13.2 |
| Turpentine (bbl. lots), N. Y., per gal. | 0.67 |

## Delaware Electric Receives Cars

The Delaware Electric Power Company, Wilmington, Del., has just received ten double-end, double-truck passenger cars from the J. G. Brill Company, Philadelphia, Pa. Plans and specifications of these cars were published in the July 28 issue of the JOURNAL, and a detailed description and photographs were published in the Exhibit Issue of Sept. 22, as this car was exhibited at the Cleveland convention.

The cars are double-end, double-truck type, seat 44 passengers and are 41 ft. 10 in. long, 8 ft. 4 in. wide, and weigh 36,640 lb. The bodies are semi-steel construction with arched roofs and folding-end doors.

The low-level platform, which has been a feature of Wilmington cars for years, has been retained in these new units. Speed in loading and unloading passengers is possible with only one step from the street to the platform. The cost of the cars is said to be about $160,000.

## Springfield Rehabilitation in 1928

Rehabilitation of trackwork for the year 1928 by the Springfield Street Railway, Springfield, Mass., cost $357,735. During the year 1927 this company spent $325,000 for trackwork, making a total of $682,735 for the two years. In the year 1928 this company also bought new equipment costing $133,345 and in 1927 the equipment purchased amounted to $920,000, including the purchase of new cars. Most of the equipment purchased this year consisted of motor coaches and accessories. However, nine different labor-saving machines were bought for use in bus and car shops.

The railway had plans for replacing the present single track on Belmont Avenue with double tracks, from Bellevue Avenue to Oakland Street, which would facilitate the operation of cars on Belmont Avenue which is a very heavy traffic line. However, this project had to be postponed as the city was not ready to widen the street.

## TRADE NOTES

WILLIAM W. TEFFT, who has been chief engineer of the Commonwealth Power Corporation for the last five years, has resigned to devote his entire time to his consulting engineering practice. He continues his residence and official headquarters in Jackson, Mich., where he has lived for many years. His association with the Commonwealth properties began in 1902 and for some years preceding his appointment as chief engineer of the Commonwealth he was a member of the Fargo Engineering Company. Mr. Tefft is the inventor and owner of the Tefft conduit spillway and accelerator which has been installed in several large hydro-electric developments during the last few years.

JAMES W. ARMOUR has been elected vice-president of the Riley Stoker Corporation, with headquarters at Worcester, Mass. Mr. Armour was graduated in mechanical engineering in 1913, from the Worcester Polytechnic Institute, and after four years in the pattern making business in that city served overseas in the ordnance department, attaining the rank of captain in the 26th division, A.E.F. He entered the drafting department of the Riley Corporation at Worcester in 1919, and after one year was transferred to the Detroit plant of that organization as inspector. He rose to the post of superintendent during the next five years and in 1925 returned to Worcester as engineering manager of the company.

C. C. CREIGHTON, district manager Galena Signal Oil Company, with headquarters in Chicago, has resigned to accept a position with the Standard Oil Company of New York as special representative of the industrial lubrication division, which comprises the railroad lubrication department. Mr. Creighton's experience in the railroad field and his many years service in various departments of the Galena well equip him for his new position. During the World War Mr. Creighton served as a flying instructor in the British Royal Air Force. His new address is care of the Standard Oil Company of New York, Room 1229, 26 Broadway, New York City.

# Just notice how many specifications read like this:

# "Brakes.... Peacock Staffless"

AS you read this publication from week to week, just notice how many specifications on new cars include Peacock Staffless Brakes.

If you should ask the why and wherefore you would probably get a reply like this:—

"We get more braking pressure for our money and yet we get less weight. It occupies less platform space, which means a lot in modern cars. But above all we know that Peacocks always function, never clog with chain. That in itself takes a big load off our minds. For it means safety guaranteed. And last, but not least, the maintenance is low. Why this is so, we do not know. We never looked inside. We never have to."





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# Easy to Take Off—Easy to Put Back *with* Goodyear Type "K" Rims



WRESTLING with a heavy truck or bus tire on a very hot day or a very cold day or any kind of a day is far from fun!

GOODYEAR TYPE "K" RIMS have won the hearts of the men who run the trucks and buses because they make tire changing an easy task. These rims make any wheel *demountable at the rim* with ONLY HALF THE WEIGHT TO HANDLE.

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Type "K" Rims are very powerful yet light in weight, easy to install and inexpensive to replace. They are adaptable for either single or dual rears, and make changing from solid or cushion tires to pneumatics a simple matter.

A *big feature* is the reduction of brake-drum heat by permitting the use of ventilated wheels.

Many truck and bus manufacturers are now specifying these *efficient, economical* and *practical* Goodyear Type "K" Rims as standard equipment, for they meet every requirement of the fleet.

Write immediately to Akron, Ohio, or Los Angeles, California, for complete information. If you are a manufacturer, Goodyear engineers will be glad to co-operate with you in every way possible.

GOODYEAR

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## Type "K" Truck & Bus Rim Equipment


No. 8M5 Special


No. 327-M Special

No. 327-M Special seats are in use by the Virginia Electric and Power Company, which was awarded the Charles A. Coffin medal for 1928.

## DESIGNED FOR INTERURBAN USE

THE 327-M Special is a popular Heywood-Wakefield electric railway seat. The deep, double spring construction of the cushion and the restful pitch of the spring-filled backs make this attractive style one of the most comfortable interurban seats ever offered.

The 8M5 Special is a de luxe interurban type with spring-filled seats and backs. It has been purposely designed and built to withstand the most severe use and abuse, while delivering trouble-proof service year after year.

Our car seating experts will be glad to assist in solving your equipment problems. This service is yours without cost or obligation. Just write to the nearest Heywood-Wakefield sales office.

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H. G. Cook, Hobart Bldg., San Francisco, Calif.
The G. F. Cotter Supply Co., Houston, Texas
The Railway and Power Engineering Corporation
133 Eastern Ave., Toronto; Montreal; Winnipeg, Canada






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## *"Delivered close to One Hundred Million Miles on our fleet last year"*

"We operate three hundred motor stages daily, over 7,000 route miles of highway, from Portland, Oregon, down the West Coast thru San Francisco, Los Angeles, San Diego, Phoenix, El Paso to St. Louis, serving a total of 1700 cities and towns along the way.

"Firestone Gum-Dipped Tires gave us close to one hundred million miles of service during the past year. Encountering every conceivable condition of weather, climate, roads, grades—from snow and ice in the mountains to blistering heat in the desert country; from smooth, modern highways to rough, chopped-up roads; through storms, washouts and actual floods, your tires and service helped us establish an amazing record for on-time service.

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CHAS. F. WREN, *President,*
Pickwick Stage Lines, Inc.

The Mark of Quality

Firestone sets up a program of tire service according to the individual needs of each operator. Firestone Dealers throughout the country have been especially trained and equipped for this work. Many have built new service stations, or modernized their quarters, installing the latest equipment for repairs and complete service of tires, tubes, rims and wheels.

This is the service that helps Firestone Gum-Dipped Tires give operators safe, economical and trouble-free performance, regardless of weather, roads or type of vehicle.

See your local Firestone Dealer and find out about the Firestone Proposal of Service. Or this information will be mailed to you if you will write our Home Office at Akron, Ohio.

MOST MILES PER DOLLAR

# Firestone

Gum-Dipped TIRES

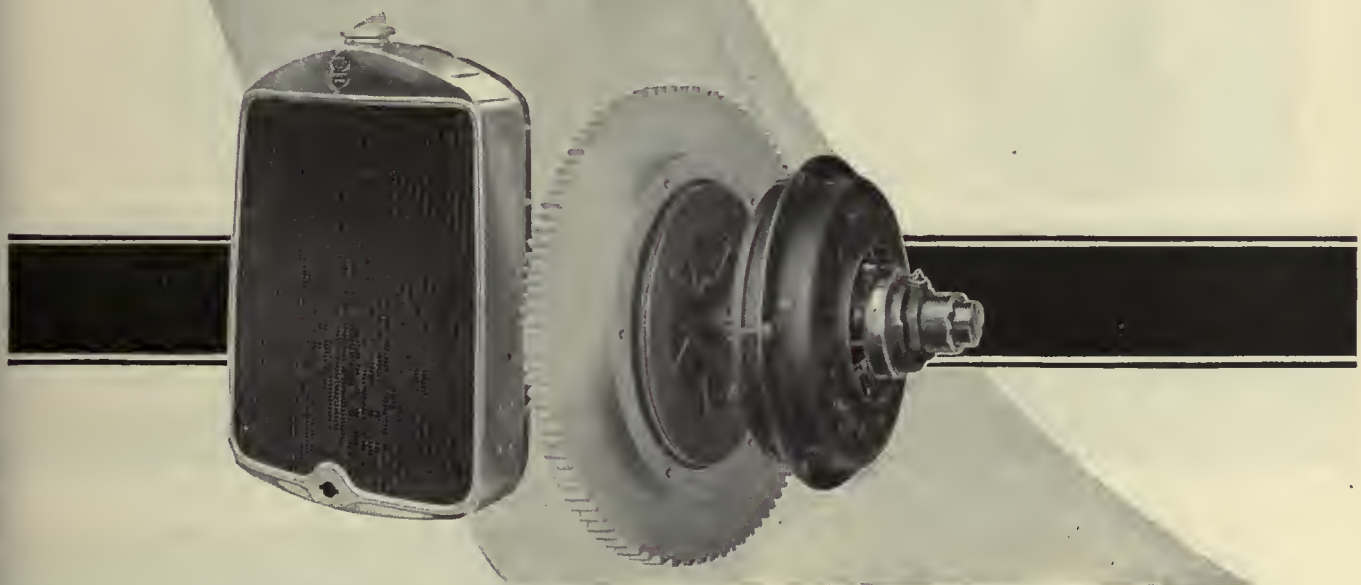
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# DURABILITY

We build durability into each Long Clutch and Radiator. With an unchanging personnel and low labor turnover we can more easily control the manufacture and assembly of the component parts which go into these products.

LONG MANUFACTURING COMPANY
Detroit, Michigan



# LONG

LONG PRODUCTS—AUTOMOTIVE CLUTCHES AND RADIATORS



# USEFUL AS WELL AS ORNAMENTAL



**IT is one thing to build a beautiful headlamp — but an entirely different matter to build one which furnishes the kind and quantity of light so necessary for safe and comfortable night driving.**

**Thus, it is explained why Guide Tilt Ray Headlamps have become so popular among motor car builders, and why so many new vehicles are coming Tilt Ray equipped — for Guide Tilt Rays are useful as well as ornamental. The Guide Motor Lamp Manufacturing Co., Cleveland, Ohio.**





DRIVING RAY



PASSING RAY

**Guide**

**TILT RAY HEAD LAMPS**

# What Should You Pay for Lubrication?

## *It all depends:—*

1 How much protection to machine and equipment do you want? (All you can buy.)

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3 What degree of efficiency do you expect from your equipment? (The maximum, certainly.)

These are matters that have a direct bearing on the cost for lubrication.

We know lubricants and we know the problems that may be encountered in their application.

We know that varying degrees of efficiency may be expected from each kind and type of lubricant.

And we agree, that YOU, the buyer, must consider price in figuring costs. But we ask you, for your own good: Never consider price first, but always last. Because only in the end —after the lubricant has had a chance to do its work—can you tell what lubrication costs. That is the only way to judge—by results of lubrication.

Judged by results, TEXACO lubricants are the cheapest lubricants you can buy.

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Because of the results obtainable—what they save—not what they cost—TEXACO LUBRICANTS are being used in more and more power plants, shops, mines and mills throughout the country, on every conceivable kind of equipment.

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# Creosoted Pine

## *absorbs shock*
## *resists decay*
## *can't rust—costs less*



*Top view and insert show Prettyman Pine Ties on air seasoning yard and careful inspection and selection before treatment. Lower photo is of Prettyman Preserved Pine Ties in street railway tracks of South Carolina Power Company.*

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# J. F. Prettyman & Sons
## Wood Preserving Plant
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# Heralding a year of activity and progress

## *The* ANNUAL STATISTICAL ISSUE

of

## Electric Railway Journal

## *January 12, 1929*

This important issue is being awaited with even greater interest than usual. It will chronicle the achievements of a year that has seen encouraging progress. And it will forecast an increasingly optimistic picture for 1929.

The contents of the issue will include the basic statistics for 1928; a complete picture of the Industry's budgets for 1929; high spots of the year's progress in financing, construction, operation and maintenance, and a review of the advances made by manufacturers.

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PEOPLE naturally seek the most pleasant mode of travel and many are turning to the rapidly increasing number of motor buses for suburban, interurban and long distance transportation.

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Balsam-Wool provides the maximum of heat stoppage, assuring warmth and comfort to passengers.

It is light weight, flexible, tough and non-settling, highly fire-resistant, odorless and sanitary.

For motor coach manufacturers we have valuable facts regarding Balsam-Wool that will make your buses attractive to passengers the year round. We will gladly supply them together with samples of this effective insulation. Write today.

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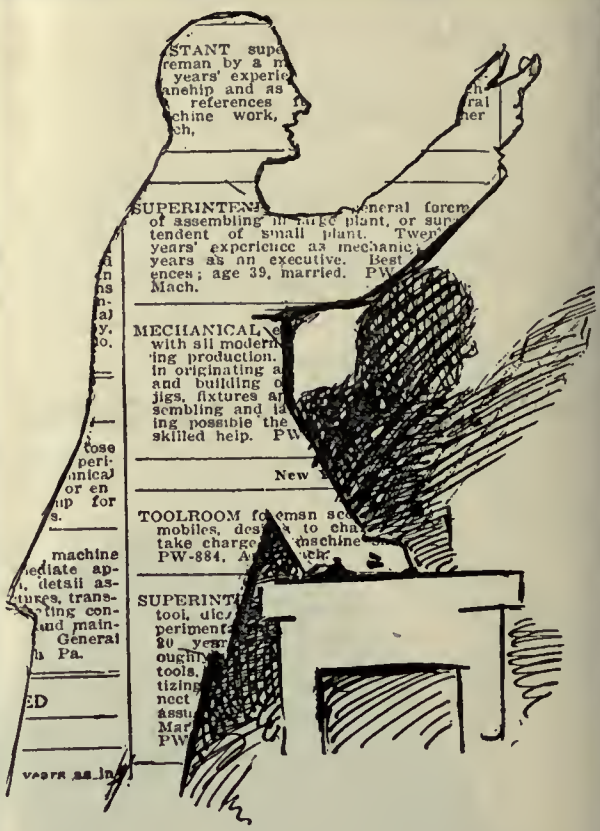
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**Vitrified brick pavements are unquestionably the most desirable and economical pavements between and adjacent to street railway tracks.**

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|---|---|
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An organization of experienced engineers, prepared to assist you in the installation of highway operations as a substitute for or a supplement to your rail operations.
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BLOCK SIGNALS FOR ELECTRIC RAILWAYS
HIGHWAY CROSSING SIGNALS



**Hale and Kilburn SEATS**

Better Quality Seats For Cars and Buses

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*Also at all works*

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ELECTRIC HEATERS WITH OPEN COIL OR ENCLOSED ELEMENTS
THERMOSTAT CONTROL—VENTILATORS
WRITE FOR NEW CATALOGUE

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*Standard on 60 Railways for*

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Differential Crane Car
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THE DIFFERENTIAL STEEL CAR CO., Findlay, O.

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AND ALL OTHER TYPES

*Descriptive Catalogue Furnished*

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EXPORT REPRESENTATIVE: U. S. STEEL PRODUCTS CO., NEW YORK. PACIFIC COAST REPRESENTATIVE: U. S. STEEL PRODUCTS COMPANY, SAN FRANCISCO, LOS ANGELES, PORTLAND, SEATTLE.

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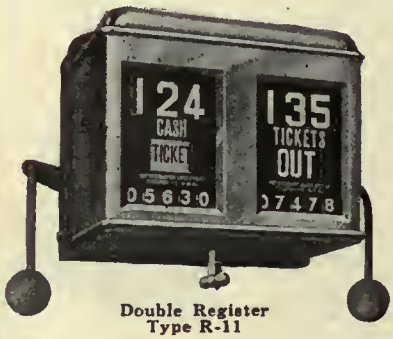
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Manganese Steel in Trackwork, originated by Wharton over thirty-four years ago, is still the metal par excellence for this purpose.

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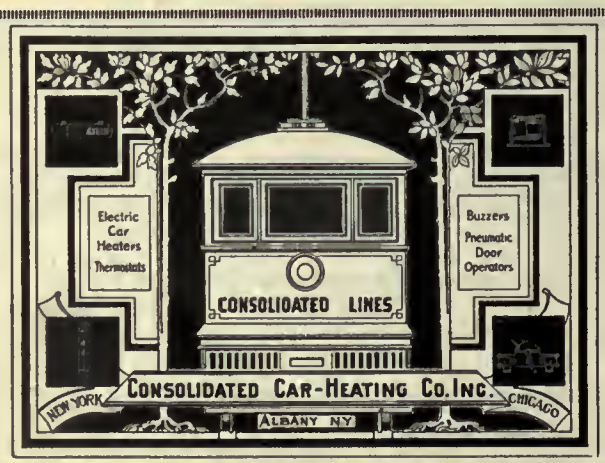
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STREET railway superintendent, also bus operator, will be open for employment about January first. Experienced in disposing of street railway equipment and installing buses. Speaks Spanish; is electrical and mechanical engineer. Can go anywhere. PW-148, Electric Railway Journal, Tenth Ave. at 36th St., New York.

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Watch the
SEARCHLIGHT SECTION
for Equipment-Opportunities

### OFFICIAL PROPOSALS

Bids: Dec. 19.

#### Furnishing and Delivering Cars and Equipment

New York, N. Y.

Notice is hereby given that a public hearing will be held at the office of the Board of Transportation of The City of New York, at No. 49 Lafayette Street, Borough of Manhattan, on the 19th day of December, 1928, at 11:30 a.m., on the proposed terms and conditions of the draft form of contract for furnishing and delivering cars and car equipment complete, except for motors, for New York City's new subway system.

Copies of said draft of proposed contract may be obtained at the office of the Board of Transportation at one dollar each.

JOHN H. DELANEY, Chairman.
FRANCIS J. SINNOTT, Secretary.
November 27, 1928.

Bids: Dec. 18.

#### Furnishing and Installing Signal Equipment, Etc.

New York, N. Y.

Notice is hereby given that a public hearing will be held at the office of the Board of Transportation of The City of New York, at No. 49 Lafayette Street, Borough of Manhattan, on the 18th day of December, 1928, at 11:30 a.m., on the proposed terms and conditions of the draft form of contract for furnishing and installing signal and interlocking equipment on New York City's new subway system along and under Central Park West, Eighth Avenue, St. Nicholas Avenue, Broadway, Fort Washington Avenue and Broadway, and 207th Street, from 68th Street to and including the 207th Street Yard at the Harlem River, in the Borough of Manhattan, City of New York.

Copies of said draft of proposed contract may be obtained at the office of the Board of Transportation at one dollar each.

JOHN H. DELANEY, Chairman.
FRANCIS J. SINNOTT, Secretary.
November 27, 1928.

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*Immediate Delivery*

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*Cars, Motors, Trucks and Parts*

WANTED
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In good operating condition. Trucks Brill 79-E, Westinghouse 508-A Motors, K-63 Br. Controllers, General Electric C. P. 25 Air Equipment.
SIOUX CITY SERVICE COMPANY,
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*It's Direct—*

THE SHORT WAY between the man with rolling stock and equipment to sell, and the buyer, is Electric Railway Journal.

When you have idle equipment to dispose of, advertise it in the Searchlight Section of Electric Railway Journal. No trouble; no delay.

# WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors Advertising in this Issue

This index is published as a convenience to the reader. Every care is taken to make it accurate, but *Electric Railway Journal* assumes no responsibility for errors or omissions.

**Advertising, Street Car**
Collier, Inc., Barron G.

**Air Brakes**
General Electric Co.
Westinghouse Tr. Br. Co.

**Anchors, Guy**
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

**Armature Shop Tools**
Columbia Machine Works
Elec. Service Supplies Co.

**Automatic Regulators, Voltage, Current & Synchronizing**
American Brown Boveri Electric Corp.

**Automatic Return Switch Stands**
Ramapo Ajax Corp.

**Automatic Safety Switch Stands**
Ramapo Ajax Corp.

**Axles**
Bemis Car Truck Co.
Bethlehem Steel Co.
Brill Co., The J. G.
Cincinnati Car Co.
Westinghouse E. & M. Co.

**Axles (Front and Rear) Motor Truck and Passenger Car**
Timken-Detroit Axle Co.

**Axles, Trailer and Motor Bus**
Timken-Detroit Axle Co.

**Babbitting Devices**
Columbia Machine Works

**Badges and Buttons**
Elec. Service Supplies Co.
International Reg. Co., The

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Nat'l Carbon Co.
Nichols-Lintern Co.

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Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works
Westinghouse E. & M. Co.

**Bearings, Center and Roller Side**
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Columbia Machine Works
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**Bells and Buzzers**
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**Bells and Gongs**
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Cincinnati Car Co.
Columbia Machine Works
Elec. Service Supplies Co.

**Benders, Rail**
Railway Trackwork Co.

**Bodies, Bus**
Brill Co. The J. G.

**Bolts, Case Hardened**
American Steel Foundries
Bemis Car Truck Co.

**Bond Testers**
American Steel & Wire Co.
Electric Service Supplies Co.

**Bonding Apparatus**
American Steel & Wire Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.

**Bonds, Rail**
American Steel & Wire Co
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.
Westinghouse E. & M. Co.

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Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.

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American Steel Foundries
Brill Co., The J. G.
Cincinnati Car Co.
National Ry. Appliance Co.
Westinghouse Tr. Br. Co.

**Brake Shoes**
Bemis Car Truck Co.
Brill Co., The J. G.

**Brake Testers**
National Ry. Appliance Co.

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Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
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Nat'l Paving Brick M'f'rs Ass'n

**Brick, Vitrified**
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Nat'l Carbon Co.

**Brushes, Metal Graphite**
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**Buses, Motor**
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National Ry. Appliance Co.

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Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works

**Cables (See Wires and Cables)**

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General Electric Co.
Irvington Varn'h & Ins. Co.

**Carbon Brushes (See Brushes, Carbon)**

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Nat'l Carbon Co.

**Carbon Plates, Welding**
Nat'l Carbon Co.

**Carbon Rods, Welding**
Nat'l Carbon Co.

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Elec. Service Supplies Co.

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Consolidated Car Htg. Co.
Westinghouse E. & M. Co.

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Cincinnati Car Co.

**Car Wheels, Rolled Steel**
Bethlehem Steel Co.

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Brill Co., The J. G.
Differential Steel Car Co.

**Cars, Gas-Electric**
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General Electric Co.
Westinghouse E. & M. Co.

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Brill Co., The J. G.

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Brill Co., The J. G.
Cincinnati Car Co.
Kuhlman Car Co., O. C.
Twin Coach Corp.
Wason Mfg. Co.

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Columbia Machine Works

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Bemis Car Truck Co.
Columbia Machine Works
Standard Steel Works

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Bemis Car Truck Co.
Columbia Machine Works

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Elec. Service Supplies Co.
Ohio Brass Co.

**Chairs, Parlor Car**
Heywood-Wakefield Co.

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Electric Service Supplies Co.

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Cincinnati Car Co.

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General Electric Co.
Westinghouse E. & M. Co.

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Ohio Brass Co.
Westinghouse E. & M. Co.

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Oakite Prod., Inc.

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Cincinnati Car Co.

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Long Mfg. Co.

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Columbia Machine Works
Elec. Service Supplies Co.
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Westinghouse E. & M. Co.

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Johnson Fare Box Co.

**Coin Counting Machines**
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Johnson Fare Box Co.

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**Copper Wire Instruments, Measuring, Testing and Recording**
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Ohio Brass Co.
Westinghouse Tr. Br. Co.

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Wm. Wharton, Jr. & Co.

**Crossings, Frogs & Switches**
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

**Crossings, Manganese**
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

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City of Coral Gables

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Wish-Service, P. Edward

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Lorain Steel Co.
Ramapo Ajax Corp.
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Texas Co., The

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Columbia Machine Works
Electric Service Supplies Co.
Westinghouse E. & M. Co.

**Gears and Pinions**
Bemis Car Truck Co.
Columbia Machine Works

Continued on page 46

# Isn't the real question: *"How much per mile?"*



*Bethlehem Forged Steel Axles match Bethlehem Rolled Steel Wheels in strength and wearing qualities. They can be furnished rough-turned all over or finished, and untreated, annealed or heat treated.*

The purchase of car wheels is really the purchase of so much mileage. That means that, considering merely the original cost, no wheel is of itself an expensive one, no wheel an economical one. It all depends on the *cost per mile!*

On a cost-per-mile basis— the only true basis of comparison—many railway executives have found that Bethlehem Rolled Steel Wheels are the most economical wheels that can be used. Their life in service is very long. And, cars equipped with Bethlehem Wheels keep moving and earning revenue. They do not have to be frequently laid up while broken, cracked, or flat wheels are being replaced.

Safety and long life are worked into Bethlehem Rolled Steel Wheels in the making. Five distinct forging and rolling operations are necessary to produce a Bethlehem Wheel. Forging gives the metal toughness and density; rolling improves the grain structure throughout the entire wheel, tending to prevent crystallization in the flange and tread, and virtually eliminating the possibility of breakage.

There are easier, less expensive methods of manufacturing wheels. But the care that goes into the making of Bethlehem Wheels is more than justified by the long, trouble-free service that they give, and by their low cost per mile.

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*District Offices*: New York, Boston, Philadelphia, Baltimore, Washington, Atlanta, Pittsburgh, Buffalo, Cleveland, Detroit, Cincinnati, Chicago, St. Louis, San Francisco, Los Angeles Seattle, Portland and Honolulu.

*Bethlehem Steel Export Corporation, New York*
*Sole Exporter of Our Commercial Products*

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*Rolled Steel*
**WHEELS**

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General Electric Co.
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**Generators**
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General Electric Co.
Westinghouse E. & M. Co.

**Girder Rails**
Bethlehem Steel Co.
Lorain Steel Co.

**Gongs (See Bells and Gongs)**

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MAINTENANCE AND CONSTRUCTION ISSUE

# ELECTRIC RAILWAY JOURNAL

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Keeping up to schedules, keeping down costs and *continuing to do it*—this is the program which bus owners seek, and Timken Bearings make an accomplished fact.

For, stress as you will the comfort of public travel and the profit of private enterprise, the importance of "Timken-Equipped" in buses becomes more emphatic; coming ever closer to being unanimous.

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

**TIMKEN** *Tapered Roller* **BEARINGS**

# THE BALANCE OF RESPONSIBILITY

*May the New Year Bring Success to the Transportation Industry through Fulfillment of Our Mutual Resolution to Maintain That Balance of Responsibility Necessary to Success*







# Our New Year's Resolutions

## *Westinghouse Resolves*

1. To use modern design and material in the manufacture of parts for old equipment.
2. To provide engineering service to the operator in the interest of economic equipment maintenance.
3. To maintain prices in accord with the value of the commodity.
4. To maintain adequate stock to assure prompt shipments.
5. To continue the use of high grade raw materials.
6. To use the most modern manufacturing practice.
7. To maintain careful inspection.
8. To provide complete ordering information.

## *The Operator Resolves*

1. To take advantage of the opportunity to modernize equipments.
2. To maintain adequate maintenance records.
3. To use only renewal parts which give the highest "Dollar Service Value".
4. To maintain renewal parts stock for protection of service.
5. To maintain thorough equipment overhaul practice.
6. To use modern maintenance methods.
7. To maintain regular and thorough inspection of equipment.
8. To maintain complete ordering information.

**The service we get from our renewal parts, and not the price we pay, determines our maintenance cost.**

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania

Sales Offices In All Principal Cities of the United States and Foreign Countries T 30233

MEMBER AERA 1928

# Westinghouse

# Electric Railway Journal

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December 15, 1928

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BETTER RAIL, BETTER TRANSPORTATION

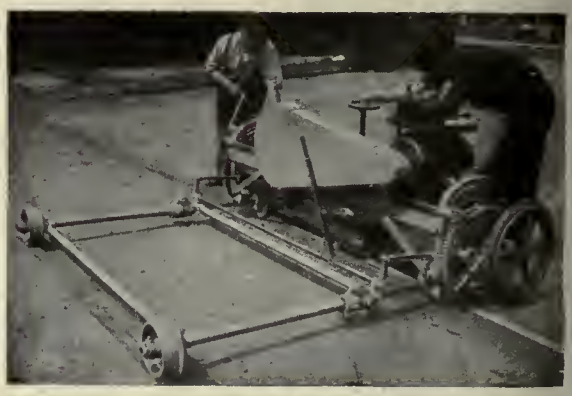
# ONLY

Good Service is founded on good track.

You can have good track without good service but you can have good service ONLY with good track.



Enreka Radial Rail Grinder



Vulcan Rail Grinder



Reciprocating Track Grinder

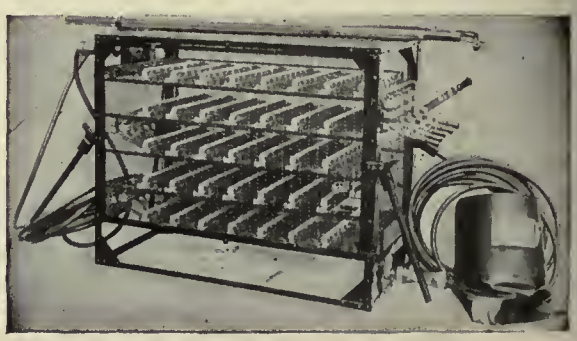
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㊊ 2867



"Ajax" Electric Arc Welder

BETTER RAIL, BETTER TRANSPORTATION




Savings in operating expense and saving your patron's good will—especially on a zero winter morning—go hand in hand. Overhead maintained and serviced by the best quality materials costs less in upkeep and goes a long way toward maintaining schedules. Thus net profits benefit.

# O-B TROLLEY SPLICERS

## Maintain Schedules When Wire Troubles Double!

WINTER weather is the overhead man's bugaboo—the days that mean more breaks, interrupted schedules, irritated patrons and heavy calls on the service crews. Records show that cold, sleet and snow practically double trolley wire breakage.

Yet, the promptness with which an O-B Splicer makes a *permanent* repair greatly minimizes the difficulties.

Ease of installation is important, but smooth approach and leave are equally valuable. The elimination of excessive wear on trolley wheels, coupled with holding strength greater than the strength of the wire, make O-B Splicers most desirable—in fact, very necessary in the winter months.

Full particulars of the popular Type C Splicer, as well as other O-B designs, will be found on pages 541 to 549 of O-B Catalog No. 20.



### Brass With a Purpose!

WITH copper and lead and zinc anyone can make brass—but for what? The combinations are infinite, as are the uses for the metal. But no group of bright inspired minds starting from scratch will ever be able to replace the years of patient study and research, and the accumulation of brass facts which goes into each O-B product, each best suited to its particular purpose in life.

**Ohio Brass Company, Mansfield, Ohio**
Canadian Ohio Brass Co., Limited
Niagara Falls, Canada
955L

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LINE MATERIALS
RAIL BONDS
CAR EQUIPMENT
MINING MATERIALS
VALVES



# Justly Known as "One-Wear"

THE term "One-Wear" wheel implies the possession of certain qualities. Qualities of wear resistance, strength and lightness that are supplied only by a special composition, heat-treated steel.

The evidence of more than a half million wheels now in service brings the verdict from the court of railroad opinion that Davis "One-Wear" Steel Wheels are truly "One-Wear." It's the special steel that makes them so.




**AMERICAN STEEL FOUNDRIES**

NEW YORK CHICAGO ST. LOUIS

# Three "Man-Hours" Walk Out

## when a Tamping Machine gets on the job!

A "MAN-HOUR" represents cash, and is equivalent to 5.2 average fares.



**Hand methods demand at least four men to tamp concrete under rail and ties in paved track construction. Only one man is needed when an International Compression Tamper is used. The difference, three laborers, may seem small at first glance. But those three laborers consume 24 "Man-Hours" or more than 124 fares in an eight hour day!**

**It doesn't take long for a few unnecessary "Man-Hours" to eat up fares that go to make operating profits.**

**And with modern mass production methods, better results are always assured; more lasting, more uniform track is always built. Machines know no fatigue, never slight their task.**

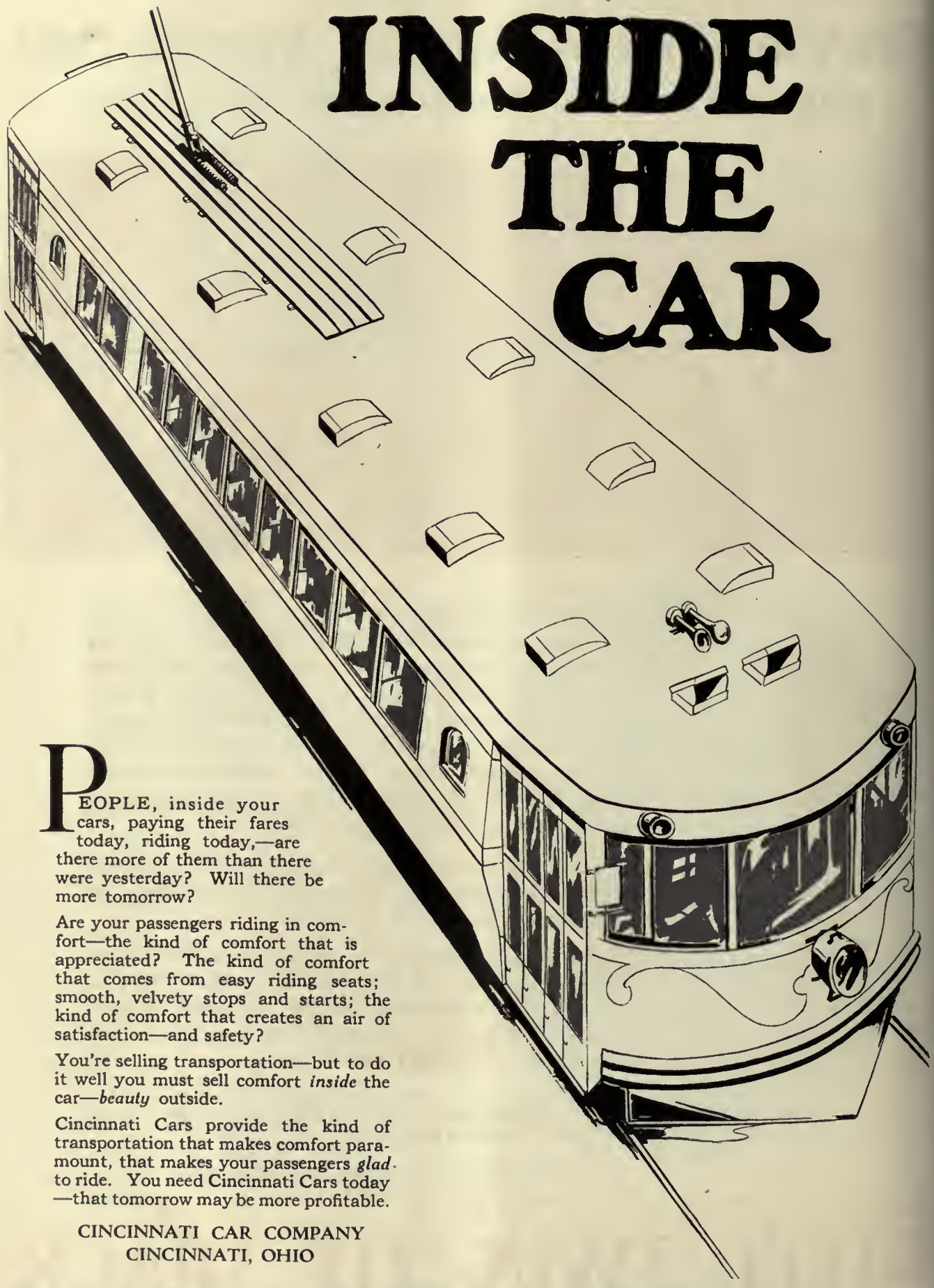
**Write today for details of the new track building machinery and delivered prices of Steel Twin Ties for your 1929 track building program.**

THE INTERNATIONAL STEEL TIE CO.
CLEVELAND, OHIO

# STEEL TWIN TIE TRACK

## THE BASE OF MODERNIZATION

# INSIDE THE CAR



PEOPLE, inside your cars, paying their fares today, riding today,—are there more of them than there were yesterday? Will there be more tomorrow?

Are your passengers riding in comfort—the kind of comfort that is appreciated? The kind of comfort that comes from easy riding seats; smooth, velvety stops and starts; the kind of comfort that creates an air of satisfaction—and safety?

You're selling transportation—but to do it well you must sell comfort *inside* the car—*beauty* outside.

Cincinnati Cars provide the kind of transportation that makes comfort paramount, that makes your passengers *glad* to ride. You need Cincinnati Cars today—that tomorrow may be more profitable.

CINCINNATI CAR COMPANY
CINCINNATI, OHIO

# CINCINNATI BALANCED LIGHTWEIGHT CARS

# SAVES 50% of GEAR CASE REPLACEMENT COST

All Keystone steel gear cases of a given type are formed by the same dies, so that halves of the same type of case are perfectly interchangeable, permitting a replacement of a broken half and frequently avoiding the necessity of throwing away the entire case. This means speed of replacement and *in most cases a saving of 50% of the cost of replacements.*

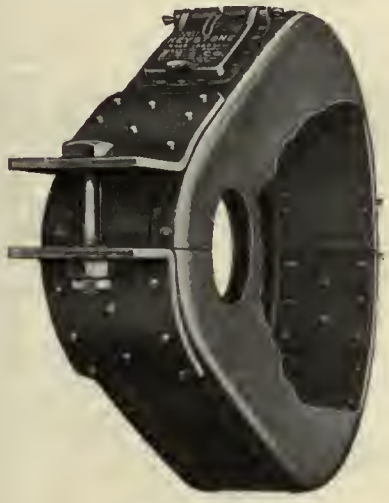
Due to combination riveting and welding Keystone steel gear cases are absolutely oil-tight. The seams can't open as often happens in an all-riveted case.

Unlike malleable cases, Keystone steel gear cases will *bend* rather than crack or break in an accident. Therefore, ordinary repairs can be made with minimum labor.

Investigate this opportunity to save half your gear case replacement costs.



Showing internal and external construction



Showing internal and external construction



Inner View of top half



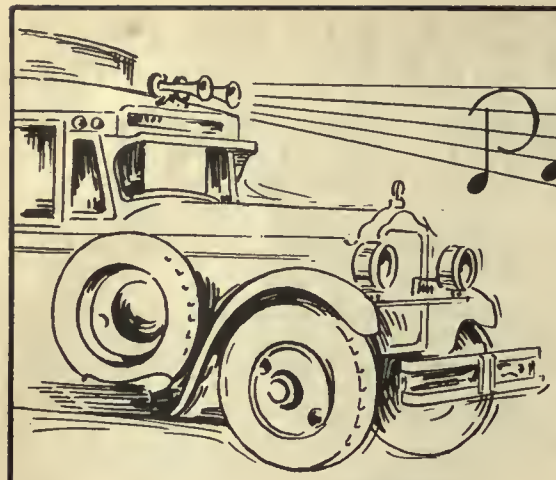


Under View of bottom half

Home office and plant at 17th & Cambria Sts., PHILADELPHIA; District office at 111 N. Canal St., CHICAGO; 50 Church St., NEW YORK; Bessemer Bldg., Pittsburgh; 88 Broad St., Boston; General Motors Bldg., Detroit; 316 N. Washington Ave., Scranton; Canadian Agents, Lyman Tube & Supply Company, Ltd., Montreal, Toronto, Vancouver.

**ELECTRIC SERVICE SUPPLIES CO.**

MANUFACTURER OF RAILWAY, POWER AND INDUSTRIAL ELECTRICAL MATERIAL




# Sounding a NEW NOTE in WARNING SIGNALS





The Westinghouse Pneuphonic Horn uses very little air, operates successfully over a wide range of pressures, and is of sturdy and durable construction. It is available in single tone or chime design.

As your bus skims over the highway or ambles through traffic its warning signal must appeal for the right of way in tones that are positive but pleasing. It must be heard—it must not be harsh. Those who step out of your way today may want to step into your bus tomorrow—their good will should be retained.

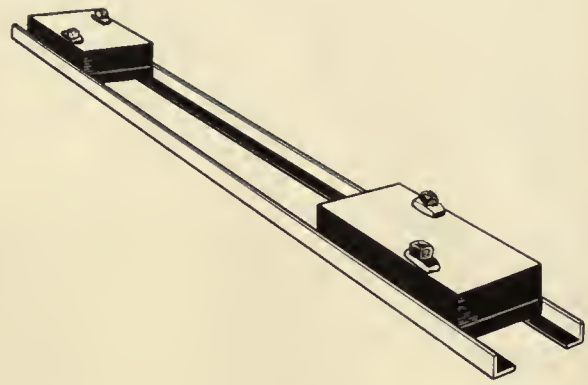
Here is a device that gives warning of approach, unmistakable, yet not irritating or startling. Its tone is loud, clear, and harmonious, easily distinguished from ordinary highway noises, and distinctly audible over a wide area.

## The PNEUPHONIC HORN

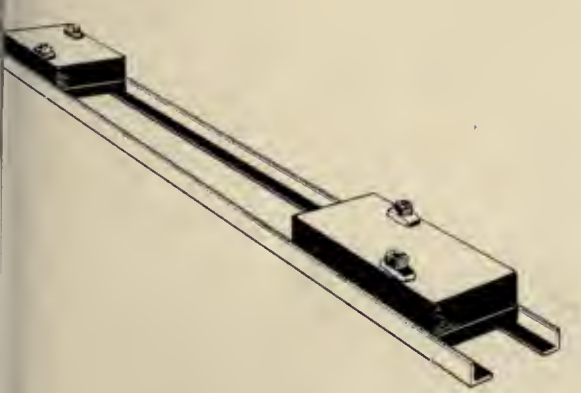
*Write us for information and prices.*

WESTINGHOUSE AIR BRAKE COMPANY

*Automotive Division - - - - - - - - - Wilmerding, Pa.*



# What Is Ease ?



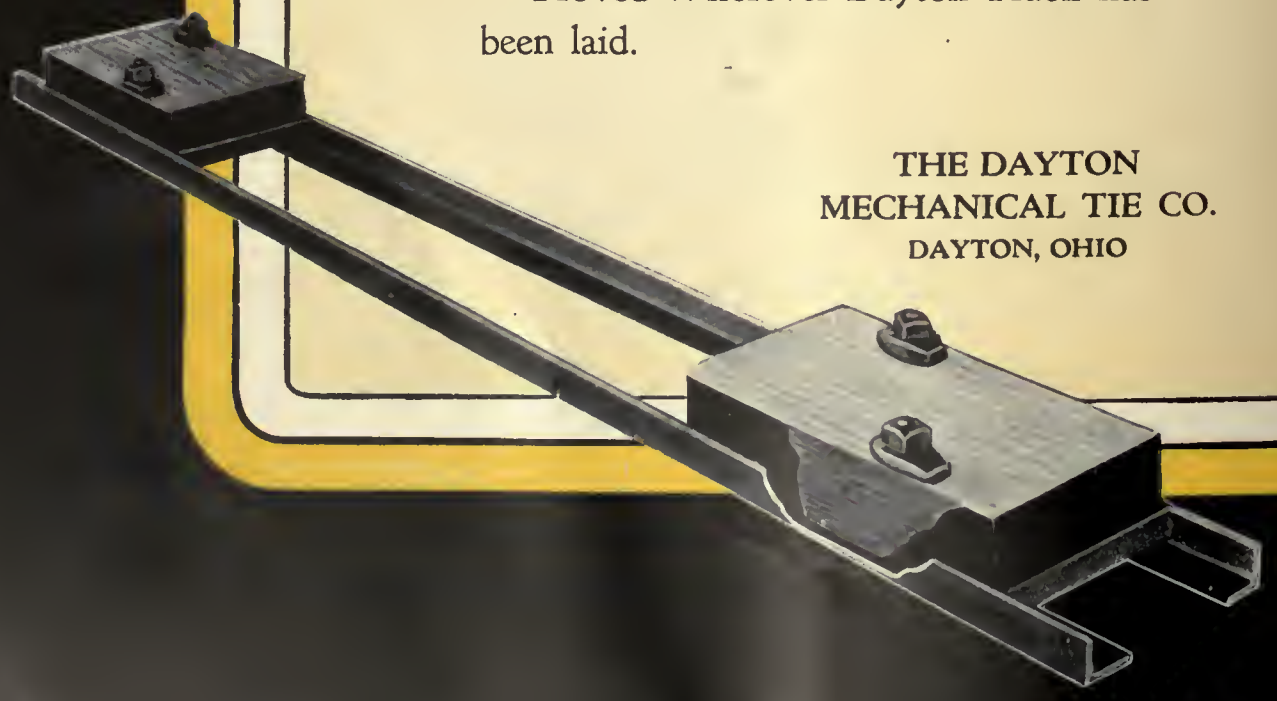
# What Is Ease Of Installation?

To be easy of installation, a substitute tie must permit placing by ordinary labor with assurance that the job will be uniformly correct.

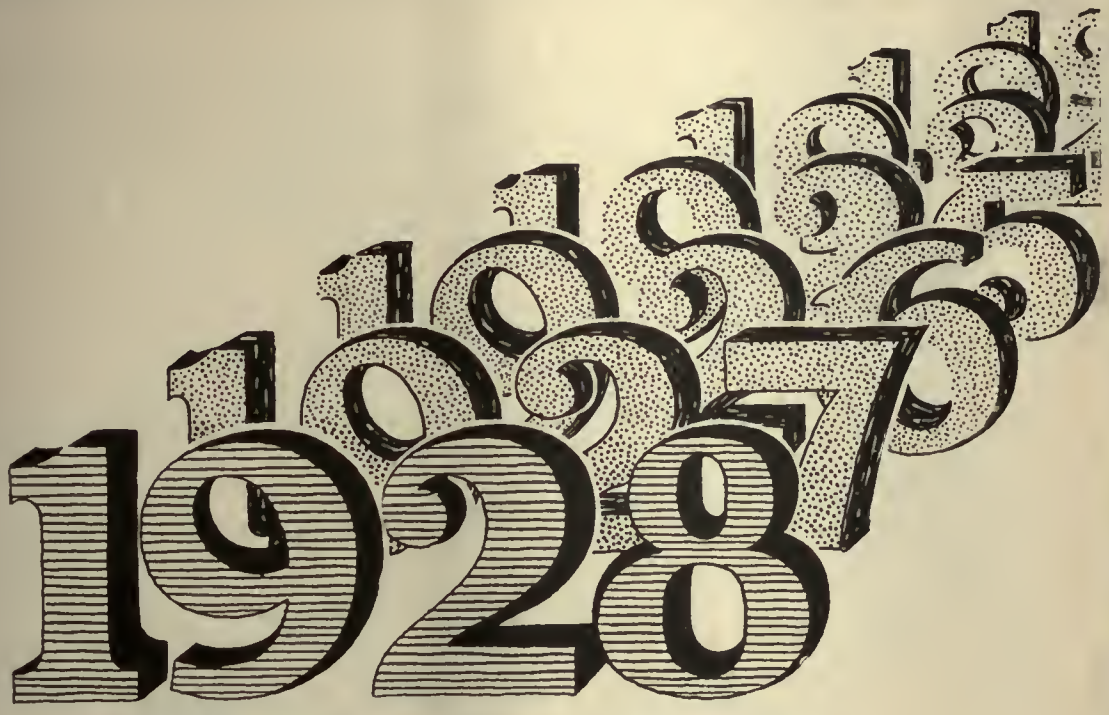
Dayton Ties fill the bill. Common track gangs have no trouble at all. They can get the concrete under every bearing part with a minimum chance of leaving voids —with a minimum chance of the human element going wrong.

This means a uniform track structure throughout, making negligible possibility of failure.

—Proved Wherever Dayton Track has been laid.



THE DAYTON
MECHANICAL TIE CO.
DAYTON, OHIO




# TREADLE-IZE
## *NOW!*

If you wish to follow the modern trend, to show a marked operating economy, to attract new riders and to please present riders, to speed up schedules and increase safety, use

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P N E U M A T I C
T R E A D L E S

NATIONAL PNEUMATIC COMPANY

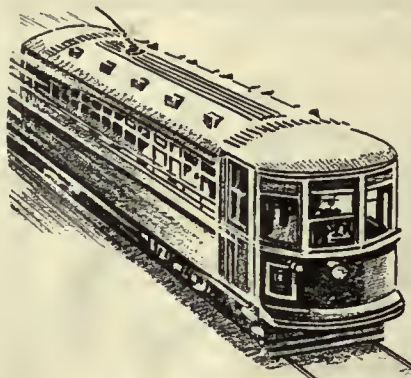
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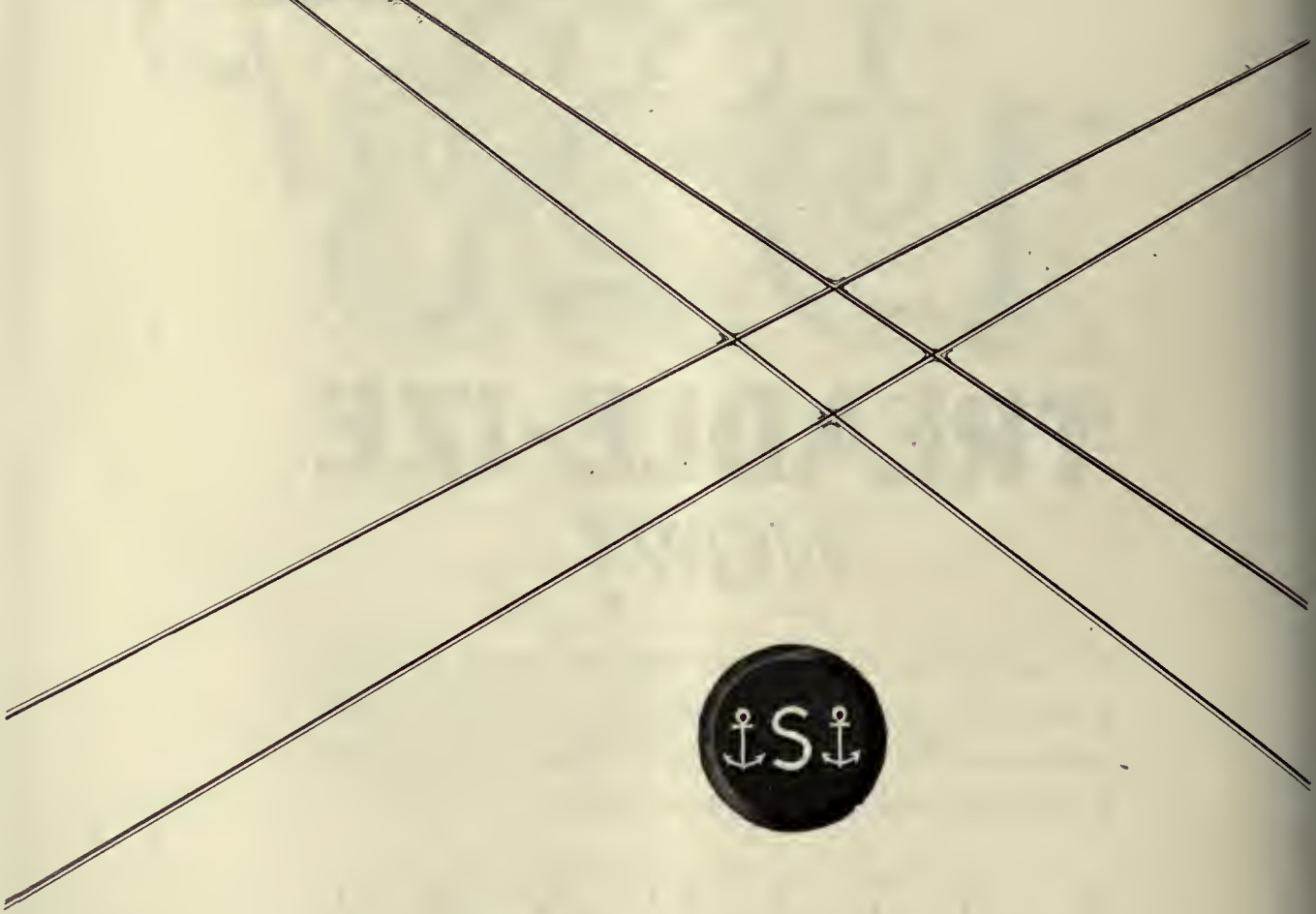
*General Works,* Rahway, New Jersey

CHICAGO
518 McCormick Building

MANUFACTURED IN TORONTO, CANADA, BY
Railway & Power Engineering Corp., Ltd.

PHILADELPHIA
1010 Colonial Trust Building





It's "miles per dollar" not "dollars per wheel" that shows the true economy of—

# STANDARD STEEL WHEELS

**STANDARD STEEL WORKS COMPANY**

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PITTSBURGH

PHILADELPHIA, PA.
WORKS: BURNHAM, PA.

ST. LOUIS
HOUSTON
PORTLAND
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# . . . and don't forget that THERMIT appropriation




THE engineer is quite right! Don't forget Thermit in your 1929 budget. There are over five million joints in city track throughout the United States. Every one of them is a probable source of expense. Many of them have been patched over and over again and are still costing money.

Why not start the new year right and set aside a definite sum for Thermit Welding, and thus eliminate a certain number of these joints once and for all.

*For it costs almost as much to patch a joint as it does to Thermit weld it. But remember Thermit Welding is a "one-time" expense, whereas patching expense usually goes on forever.*

THERMIT

THERMIT

METAL & THERMIT CORPORATION

120 BROADWAY, NEW YORK, N.Y.

PITTSBURGH CHICAGO BOSTON SOUTH SAN FRANCISCO TORONTO

# PERMANENT IDENTIFICATION

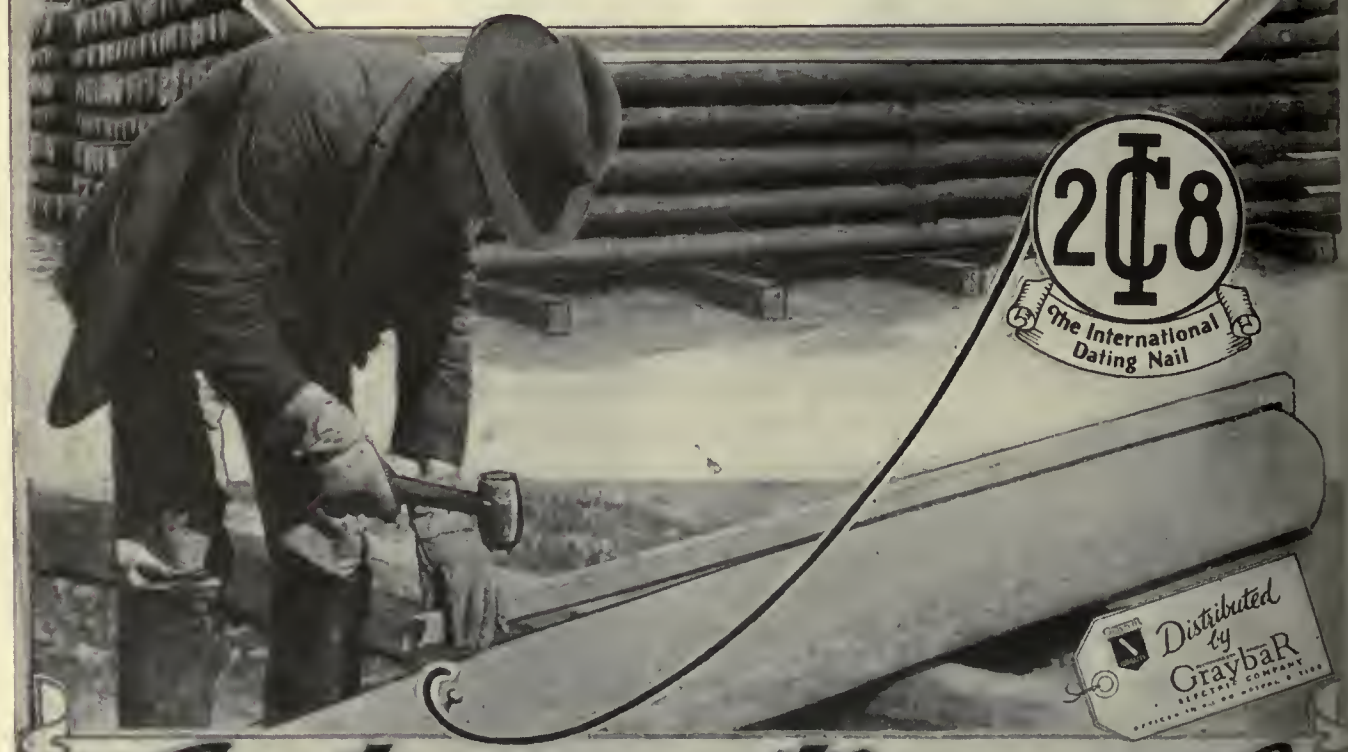
*INTERNATIONAL* inserts a copper dating nail, showing the *International* monogram and the year of treatment in every *International* Pole at such point in the length as may be specified; otherwise at a point 12 feet from the butt. This dating nail provides a permanent record so the user may know at any future date what service his pole line is giving. It tells him whether his poles are lasting as long as they should. It also stands as conclusive evidence of ***International's*** confidence in the quality of its poles, the service they will render, and ***International's*** desire to be permanently identified with them.

Thousands of ***International*** Poles are still sound after 20 to 30 years of service. Do you wonder why ***International*** trade-marks its poles?

**International Creosoting & Construction Co.**

General Office—Galveston, Texas

Plants: Texarkana Beaumont Galveston




# International Creosoted Yellow Pine Poles



# Bringing Them Out with Good Varnish

Heavy weather—insulations burned out—idle cars. Idle cars are expense items—they produce no revenue. All this because of a few cents saved in insulating materials. ¶Bring the cars out of the repair shop with G-E insulating varnish. It resists moisture and oil—it stands the gaff of rough wear. G-E varnish is continued protection through good weather and bad. ¶These varnishes were originally developed to insulate G-E railway motors and other apparatus. You are taking no chances when you specify G-E insulating materials.

Five popular G-E varnishes are:

No. 152 Clear Air Drying
No. 450 Clear Baking
No. 457 Black Air Drying
No. 460 Black Baking
No. 447 Black Baking (especially recommended for railway use.)

## PROMPT SERVICE

G-E insulating materials are sold only by G-E Merchandise Distributors located throughout the country who are equipped to give you prompt service. Get in touch with the G-E Merchandise Distributor near you or write to the Merchandise Department, General Electric Company, Bridgeport, Connecticut.

This catalog contains a complete listing of the following G-E insulating materials:



- Insulating and finishing varnishes
- Insulating oils
- Stickers
- Shellacs and paints
- Filling and sealing compounds
- Varnish-treated cloths and cloth tapes
- Flexible varnished tubing
- Insulating fibers and papers
- Motor tubing
- Asbestos and cotton tapes
- Friction and rubber tapes
- Prepared paper tapes
- Cords
- Twines

*Send for your copy to the Merchandise Department, General Electric Company, Bridgeport, Connecticut.*

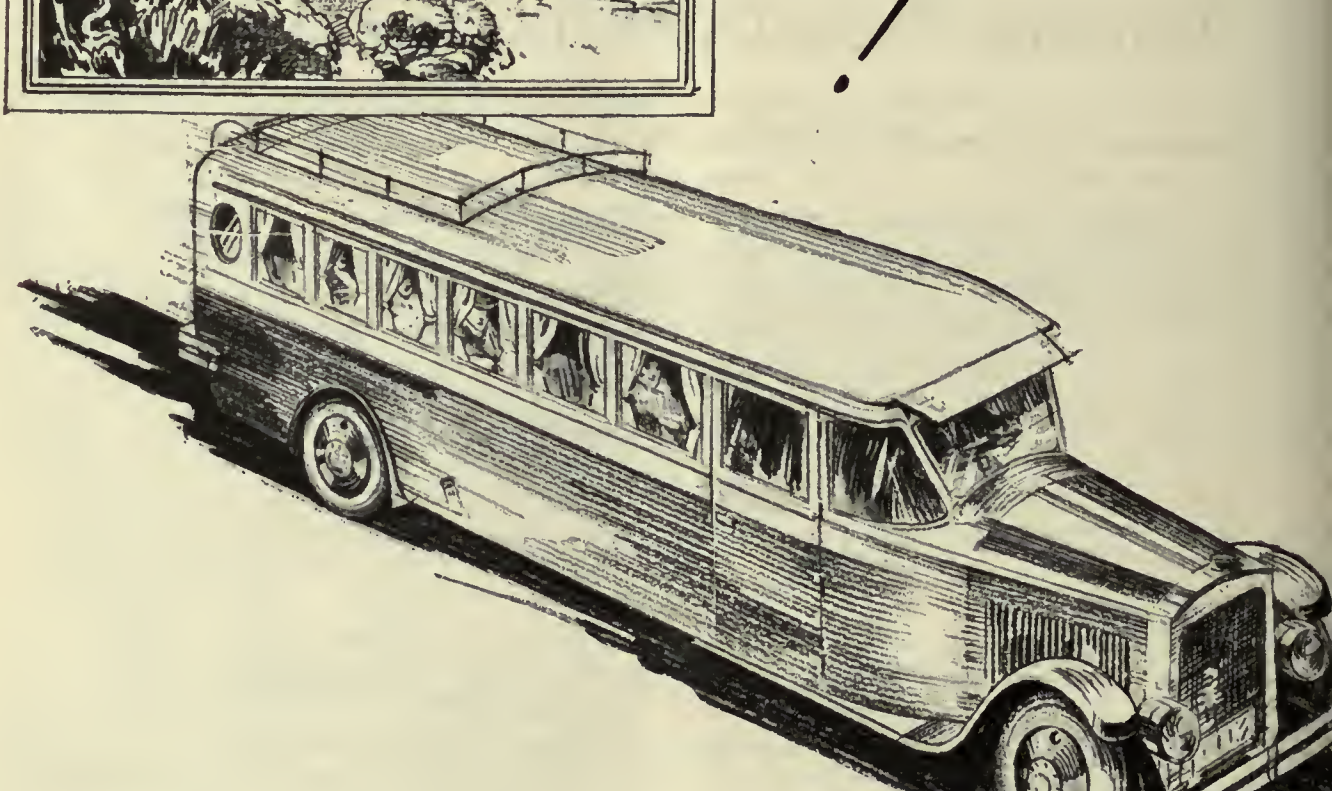
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GENERAL ELECTRIC

MERCHANDISE DEPARTMENT, BRIDGEPORT, CONNECTICUT



*An invitation to ride!*



GENERAL

GENERAL ELECTRIC COMPANY, SCHENECTADY, NEW YO

THE sale of transportation depends on the riding comfort that is offered.

This appeal must be embodied in the bus. Only a gas-electric can give that easy application of power, that gentle motion, that quick response to the guiding hand.

One operator reports that people constantly call up to learn the schedules of his G-E gas-electrics. They prefer to wait for one of these silent servants rather than ride in what they call "the old buses".

ELECTRIC DRIVE
*for*
GAS-ELECTRIC BUSES
AND TRUCKS

390-28

GENERAL ELECTRIC

SALES OFFICES IN PRINCIPAL CITIES



# Modernize
## use arc-suppressor plates to reduce maintenance

Any decrease in the burning of controller fingers, segments, and arcing plates means a reduction in maintenance. Arc-suppressor plates aid in the rapid extinguishing of the arc and so effect a material decrease in burning.

Arc-suppressor plates are standard on new controllers and are also available for old controllers with individual-finger blowout coils. The nearest G-E sales office will give you complete information.

330-106

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

# Electric Railway Journal

*Consolidation of*
*Street Railway Journal and Electric Railway Review*

McGraw-Hill Publishing Company, Inc.
James H. McGraw, *Chairman of the Board*
Malcolm Muir, *President*
H. C. Parmelee, *Editorial Director*

CHARLES GORDON, *Editor*

Louis F. Stoll,
*Publishing Director*

*Volume 72* New York, Saturday, December 15, 1928 *Number 24*

## Keeping the Whole Team in Step

FEW electric railways are entirely free from the difficulty resulting from the unequal influence exerted by the heads of the several departments. On one property it may be the equipment man whose influence predominates. On another possibly it is the track man who has the chief say; on a third, the auditor; on a fourth, the safety engineer; on a fifth, the superintendent of schedules—and so forth. To keep the influence of the department heads properly balanced is one of the vitally important duties of efficient management. It is a case of securing teamwork from a group of acknowledged specialists, each naturally enthusiastic for the advancement of his own department and more concerned about that perhaps than about the functioning of the transportation system as a whole.

To keep department heads pulling together for the good of all is not an easy task. There can be no favoritism in arranging budgets. The general manager must be a diplomat as well as an executive. He must be tactful without sacrificing one iota of final authority and he must be able to stand by his decisions as well as to make them.

## Wanted: Maintenance Equipment

UNIQUE indeed is the commercial situation presented by the action of the American Electric Railway Engineering Association in calling attention to the need for improved electric railway maintenance equipment and machinery. To say that it is a strange condition in American industrial marketing, when potential customers for maintenance machinery take the initiative in trying to interest manufacturers in their needs, is putting the situation mildly. Furthermore, when general statements of the need for improved maintenance appliances are backed up by specific examples of what is needed, this matter warrants the serious attention of manufacturers.

Following a suggestion made by the engineering executive committee, the Journal published an announcement requesting maintenance executives to outline their needs in the way of maintenance machinery and equipment. The response was almost immediate, and the first group of suggestions was published in the issue of Nov. 17. That, however, was only a beginning. In this issue there are more along the same line, and each mail brings additional letters from maintenance men adding to the list.

What have the manufacturers of such equipment to say? Obviously this demand on the part of operators represents an indictment of the commercial alertness and progressiveness of manufacturers of shop equipment. Has this class of manufacturers been overlooking the possibilities of the electric railway maintenance market? If not, what are the reasons for the unfilled demand that seems to exist? Perhaps the types of machinery needed are so highly specialized that the development costs would be expensive. Perhaps manufacturers are discouraged by other conditions or practices that exist in the electric railway field. If so, what are these conditions?

In the letters from operating men there seems to be a challenge to the alert manufacturer. The pages of the Journal are open for his reply. Inquiries from manufacturers seeking additional information or letters commenting upon the suggestions being made by the operators will be published as they are received in order that this important subject of maintenance equipment may have the fullest possible discussion.

## Significant Interurban News

CONFIDENCE in the earning capacity of the interurban when intensively developed is reflected in the news that application has just been made by the Cincinnati, Hamilton & Dayton Railway to the Public Service Commission of Ohio for permission to acquire the physical properties of the Indiana, Columbus & Eastern Traction Company and the Lima-Toledo Railroad, as well as all outstanding securities of the Lima Street Railway and of the Dayton & Columbus Transportation Company. The plan is fostered by the interests headed by Dr. Thomas Conway, Jr., which rehabilitated and converted the Chicago, Aurora & Elgin Railroad into an important earner, and more recently transformed the Cincinnati, Hamilton & Dayton, physically and financially.

Only the preliminary details of the new consolidation are available at this time, but there is every reason to believe that the development of the properties to be acquired will be carried out along intensive lines similar to those followed in the case of the Cincinnati, Hamilton & Dayton. Moreover, in the matter of the financial set-up it has been indicated that the same conservative course will be followed with respect to the capitalization of the much larger property as was done with the Cincinnati, Hamilton & Dayton. Bonded debt of the two properties now to be included will be scaled from $9,181,000 to $1,390,750, and annual interest charges cut from $469,050 to $83,445. This contemplates a financial set-up even more conservative with regard to the fixed obligations than anything the committee on finance of the A.E.R.A. had in mind, but no more drastic than owners feel necessary properly to re-establish the property on a satisfactory earning basis.

With the Cincinnati, Hamilton & Dayton as the nucleus, the proposed consolidation will form one of the large interurban systems of the country, a through trunk line direct and unbroken, between the gateway to the South at Cincinnati on the Ohio River, and Toledo and the great industrial centers on the shores of the Great Lakes,

**This is the issue in December that is devoted essentially to maintenance and construction subjects**

together with an east and west line connecting the cities of Dayton, Springfield and Columbus. To be specific, there will be 323 miles of track in the new consolidated company, and that property with its electric railroad connections will comprise a transportation network of more than 5,000 miles of track serving the great central west. This news, taken together with the previously announced organization of the Electric Railway Freight Company, certainly is significant with respect to the outlook for the interurbans in the central territory.

## Supplying Transit for Ten Million a Real Problem

NEW YORK may be said to be only at the beginning of things transit-wise. True it is that the first subway was opened 25 years ago, and that tunnels, both railway and vehicular, cross the Hudson; that passenger tunnels run under the East River to Long Island, both for railroad and rapid transit service, and that where once the architecturally impressive Brooklyn Bridge stood majestically alone over the East River, there are now three other similar structures with another contemplated over the narrows to New Jersey and still another under way across the upper Hudson to connect uptown New York with the New Jersey Palisades district.

Each of these projects has been more or less a matter of expediency. That, of course, was all wrong. It is this recognition which has led the City Club recently to declare that unless some solution of the problem is found quickly, conditions of suburban traffic probably will become, within the next five years, just as intolerable as the conditions of municipal transit are at this time. That body is, of course, cognizant of the studies made by the non-partisan Russell Sage Foundation, the New Jersey Transit Commission, and the Suburban Transit Engineering Board, composed of representatives of the North Jersey Transit Commission, the Westchester Transit Commission, the two county engineers of the counties involved in the Long Island sector, a representative of the Board of Transportation of the City of New York, a representative of the Port of New York Authority, and three representatives of all the railroads involved.

After a long study of the general problems, the City Club's committee on suburban affairs has decided that the Port of New York Authority should be authorized by proper legislative action to take charge of these suburban passenger rapid transit matters. This is an attitude that may or may not be wise in the disposition that it seeks to make of the problem, but there can be no question of the justification for the City Club's conclusion that New York's transportation problem concerns the welfare of 10,000,000 people within a radius of 45 miles from the Manhattan City Hall.

Already there has been entirely too much waste, duplication and unwise construction attributable to the failure to approach the problem in its broad aspects. Whether or not one agrees with the proposal of the City Club to lodge the matter with the Port Authority, it is certain that permanent relief demands the elimination of individual projects conceived by interested groups or sections for their own selfish interests and not for the benefit of the community at large. The extent of the vision of those likely to play a part in a unification plan such as that which the inquiries so far made would seem to indicate are essential in New York, will be measured by the willingness they show to subordinate their own pet plans to the greater one of providing a program suitable for the present and future requirements of the community as a whole. The New York transit problem is immense and intricate. But it is not an insuperable one if it is approached intelligently.

## The Back Yard No Place to Keep Lions

BITING sarcasm was turned loose by none other than Mr. Mencken of the *American Mercury,* writing in the Baltimore *Sun* about the traffic problem under the heading "Crowded Streets." It is not the first time that this wizard of words has had his withering fling in the defense of common sense in the use of the public streets. Doubtless he is a street car user. Whether or not that be so, he attacks in a fine frenzy the situation presented by modern traffic jams. He even asks why private motor cars should come into downtown streets at all.

As Mr. Mencken sees it, traffic congestion caused mainly by parked cars is an unmitigated nuisance. With this as a preliminary thrust at the privileged automobile, he turns loose a verbal broadside by declaring that parked cars in heavily traveled streets accommodate only a few idiots, delay the street cars on which 75 per cent of all users of the streets travel, and generally increase the dangers to life and limb in the streets. To Mr. Mencken it seems as insane to allow parking on such thoroughfares as Charles Street in Baltimore and the narrow part of Lexington Street as it would be to permit people to keep lions in their back yard. He contends that the streets belong to the busy man—not to the lazy and luxurious few. He asks why a hundred people should be inconvenienced in going to or from their work by a woman who refuses to walk four or five blocks. He also asks why one citizen should be permitted to appropriate 50 sq.ft. of public property for an hour or two, thus forcing all other citizens to scramble around at the risk of their lives. He says it is all too preposterous.

One thing Mr. Mencken has done. He has taken the tone of timidity out of the words with which this evil has frequently been approached. It is a case in which real militancy is needed. Far too many street railway men themselves seem to find it difficult to forget the old days—the days when street railway men, as Raymond Tompkins, author of "The Troubled Trolley" published in Mr. Mencken's paper, might possibly put it were looked upon as questionable citizens, and the railway itself as the work of Beelzebub. They need to speak up more forcefully. Mr. Mencken is right. The back yard is no place to keep lions. And the street is no place to store automobiles.

## Effective Organization Needed to Meet Abnormal Maintenance Demands

MOST electric railways need every available car for peak-load service. This is particularly emphasized by the increased volume of riding during the holiday season. Inspection and repairs during this period must be carried on under trying conditions. Nevertheless, it is particularly important that the work be done thoroughly to avoid troubles and interruptions to service during the peak traffic season of the year. Therefore, since every car is needed, it becomes necessary at this time of the year to devote particular attention to the organization of maintenance work, so that cars will be turned out rapidly.

More intensive specialization and division of work within the several general departments is an aid to in-

creased speed. Take a modern shop of a large railway. Here one finds departments for truck overhauling and repairs, motor overhauling and electrical repairs, a babbitting room, forge shop, machine shop, air-brake department, tool room, body and equipment department, paint shop and carpenter shop. Of these the forge shop and machine shop do the work for other departments, but the rest are arranged to do a wide variety of jobs on their particular part of the equipment. For greatest speed, therefore, it is necessary to subdivide the customary departmental organization so that maximum specialization will result. Some larger properties adopt the practice of drawing upon carhouse inspection forces to augment the regular shop organization during the period of maximum demand. In several instances 100 per cent of the total available equipment has been kept in service during the day or two immediately preceding Christmas.

Spare equipment and a reserve stock of principal parts lighten the load. Repairs are made better and quicker with the particular part removed from the car. When spare parts are available, the work of removal and replacement may be handled entirely separate from the actual repairs. Under these conditions maintenance work can be organized on the most efficient basis.

Average requirements are known. Any demands in excess of normal can be handled best when spare equipment is available. It is seldom that abnormal requirements extend over a long period, so that the excessive demand of one day can be taken care of the next, or if demand continues for an unusual period, a little overtime will enable the department to catch up. The spare equipment thus acts as a flywheel to equalize the load and so permits a maintenance organization to function smoothly despite abnormal temporary demands upon it.

## Faster Schedules Without Increased Maximum Speed

MUCH discussion regarding the improvement of electric railway service centers around the question of increasing the speed of travel. Passengers wish to be carried from their starting point to destination in the shortest time possible. There can be little question regarding that. But in frequent-stop city service, faster schedules do not dictate higher maximum speeds, and it is therefore important that the terms "schedule speed" and "maximum running speed" be not confused when considering the relation between speed and safety.

There is no intention of increasing the maximum speed of street cars in city streets. In fact, there is little occasion or opportunity for doing so, because the greatest possibility for time saving lies in reducing the time loss at stops and in cutting down traffic delays. Higher maximum running speed would avail little. It is through higher acceleration and retardation rates and greater alertness on the part of operators that transportation men hope to achieve faster schedules. What is needed and what is being sought is higher average sustained speed.

In considering higher acceleration rates, smooth operation is essential. With this end in view, the application of motors of larger capacity on some of the newest cars has been accompanied by improvements in control equipment which while designed to give high acceleration are intended also to provide smoothness in starting. Similar attention is being given to brake equipment. Most cars have adequate braking power after the brakes have been actually applied. But on many existing cars there is a serious lag between the movement of the brake valve handle and the actual brake application. Several railways have decreased this time lag by providing larger ports in the brake lines, by reducing the length of piping or by using special valves to provide quick applications and release. These improvements are all very desirable in that they lead toward higher schedule speeds with increased safety.

## An Occasion for Pardonable Pride

TWO state papers that would be regarded as making history if the proper perspective were applied to them were delivered last week. They are the message of President Coolidge and the annual report of Secretary of the Treasury Mellon. They deal, of course, with peace-time problems, but problems that have come in the wake of the most devastating war in history in which five dynasties fell and the world was turned upside down economically and financially.

The President's speech and the Secretary's report do not lend themselves readily to brief editorial recapitulation, but whatever doubt may have lingered in anyone's mind about the attitude of President Coolidge on the matter of governmental invasion of the field of private enterprise was definitely set at rest. In a few choice paragraphs dealing with the Colorado River project he outlined his policy. The primary purposes of the dam, if and when it is built, are to be flood control and irrigation. There will be an incidental creation of water power which could be used for the generation of electricity. "A private enterprise can very well fill this field," says the President, "There is no need for the government to go into it." After reviewing the statements of the engineers who have surveyed the project he feels warranted in recommending "a measure which will protect the rights of the states, discharge the necessary functions of government, and leave the electrical field to private enterprise." Moreover, he leaves his readers in no doubt about his interpretation of "the necessary functions of government."

In dealing with the long-delayed Muscle Shoals problem the President is equally precise. This great plant was built ostensibly for the production of nitrates for wartime and agricultural purposes, with water power as a supplemental and incidental by-product. "Rent out the power rights," says the President, "thereby realizing a revenue of approximately $2,000,000 a year." As an alternative, he would lease the entire project for the production of nitrates. "I do not think," concludes the paragraph, "this property should be made a vehicle for putting the United States government indiscriminately into the private and retail field of power distribution and nitrate sales."

Similarly specific was the Secretary of the Treasury. But it is in the restatement of the economic situation as he sees it from his unusual vantage point, that business is interested. He gives the facts, but he avoids conclusions, except as his recommendations for legislation reflect them, and in this instance these recommendations concern mostly details to permit government fiscal policies to be put into effect. Still the conclusion is inescapable that the Secretary of the Treasury is reassured about the outlook. Neither one of these men is ever likely to indulge in anything smacking of extravagance of speech, but in the light of the accomplishments of the outgoing administration, it would, indeed, be unusually adamant if it did not reflect a certain measure of pardonable pride.




Introducing the ten new Brill cars of the Delaware Electric Power Company to the public of Wilmington. The parade passed through the heart of the city's business section and created much interest

# Wilmington Solicits Public Patronage with NEW CARS

**As part of a general modernization program the Delaware Electric Power Company recently placed in service ten new cars. Equipment was formally introduced to the city in an impressive parade**

IN ITS modernization program the Delaware Electric Power Company is guided by a belief that the public will patronize public transportation of the right sort. Recently many of this company's older cars were rebuilt, new and more comfortable seats were installed, and the cars were painted a more cheerful color. Desiring to keep pace with the progressive spirit of the community which it serves, ten modern low-level cars were ordered. These were received the early part of December and the company made a gala occasion of introducing them to the public.

As soon as the cars arrived in Wilmington from the Brill plant in Philadelphia, the city's newspapers were informed by the management of the company's plans to hold a parade, and were given a description of the new equipment. Interest was stimulated in the parade by placing the cars in service temporarily on Sunday, Dec. 2. At noon of the next day the entire ten cars, gaily decorated with the national colors, started from the Pennsylvania Railroad Terminal on Second Street, traveled over Market Street, the principal business thoroughfare, to the Hotel du Pont at Tenth Street, and from Tenth Street to Delaware Avenue. The long line of attractive and brilliantly decorated cars, stretching almost a quarter mile attracted many people and brought forth much favorable comment.

The arrangements for the parade were under the direction of D. E. Frame, master mechanic of the Delaware Electric Power Company, who was closely identified with the cars while they were being built in the Brill plant. P. T. Reilly, general manager, H. H. Geiger, superintendent of transportation, and R. T. Greer, assistant to the master mechanic, were also present at the demonstration.

On the following day, Dec. 4, the ten cars were placed in regular service on the company's Delaware Avenue line. This particular line serves a residential district terminating in the heart of the city's business section, and is an important route of the system.

### Cars Designed to Meet New Demands

The ten double-truck, double-end, safety cars, one of which was exhibited at the A.E.R.A. convention in Cleveland in September, are "modern" in every sense of the word. A unique painting scheme, both exterior and interior illumination, and every detail of design have been developed by the company to meet the new demand for improved appearance, comfort, safety and convenience.



A unique painting scheme gives the car a striking appearance



The wide full vision front window, sun visor and hinged side sash give a pleasing effect. The dashers are floodlighted at night

A single step from the street to the platform permits quicker loading and unloading, and the elimination of unnecessary delays, with ease and convenience to passengers. Both platforms and body floors are ramped to obtain necessary truck clearance and to keep the step height to the minimum. The step from the street to the platform is 15¼ in., and the inside step 13 in. There is a ramp of 2½ in. on each side of each platform, and a 3-in. ramp in the car floor extending from the end sills to the body bolsters.

All doors are pneumatically operated and under the control of the motorman. A selector valve permits the operation of any door separately on the service side of the car. With an automatic treadle on each platform at diagonal corners, which controls a single two-part folding door, a circulating passenger load is accomplished. All passengers enter at the front and leave by way of the rear platform, thus eliminating any confusion inside the car. For safety reasons the control of this automatic treadle is interlocked with the brakes in the engineer's valve. The brakes must be applied and the car stopped before it is possible for the treadle to function. When desired, the operator may also prevent any passenger standing on this automatic treadle from leaving the car by throwing a switch at the front platform and making the treadle inoperative.

The cars are equipped with four 35-hp. motors, which are capable of accelerating the car very rapidly. Lightweight steel was used extensively in the construction of the car, another factor responsible for the rapid acceleration and retardation rates possible. Variable load brakes also were used.

### Colorful Painting Scheme for Exterior

The painting scheme of orange, cream and red, and a complete system of exterior and interior illumination give the car a bright and cheerful appearance at all times. A row of lights over each dasher, floodlights at the doorways, stop lights and illuminated "exit at rear" signs inside the car, both of which function only upon application of brakes, and an ample supply of interior lights all contribute toward this end.

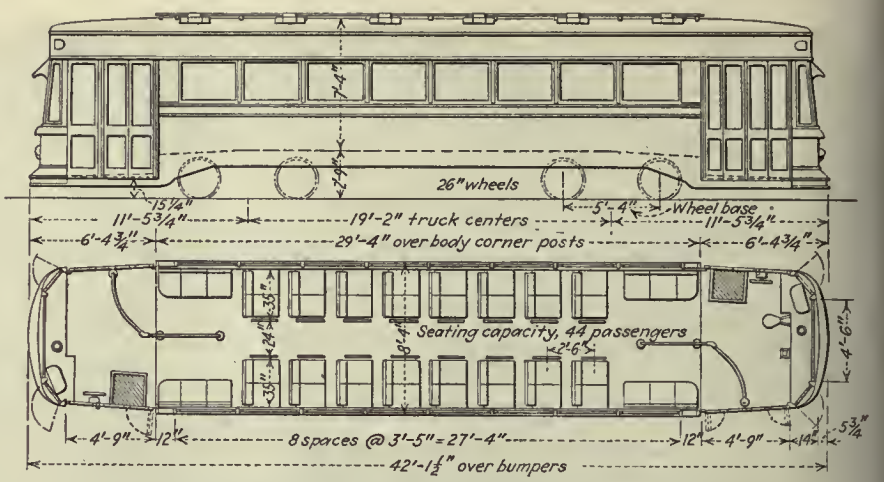
The appearance of the interior is enhanced by the finish of mahogany, the equipment cabinet on each platform hiding the various operating devices, a tan colored Flexolith floor laid on top of yellow pine flooring, a white enameled Agasote ceiling which extends through the car from vestibule to vestibule without interruption, and brown genuine leather upholstered reversible seats of the Brill No. 201-D type.

Wide full vision windows, with 3-ft. 5-in. post centers, and fitted with single metal sash which raise, also help to make car riding attractive. Each vestibule is fitted with central stationary sash, 4 ft. 6 in. wide, flanked on each side by a smaller hinged sash. All sash are of narrow tubular brass and those in the vestibule are fitted with non-shattering glass. This gives the operator and

passengers an unobstructed view forward, and at the same time the hinged sash, which may be opened any desired distance, assure adequate ventilation.

The elimination of body-end bulkheads not only affords an opportunity for a freer and quicker movement of passengers through the car body, but also contributes to a better view forward for the passengers. At each end sill, channel posts extend from side sill to side sill, serving as a support for the Haskelite roof and assuring necessary strength at this point. Commercial steel shapes, combined with pressed steel U-shaped side posts, deep aluminum letterboards between the corner posts and a side sheathing of $\frac{3}{32}$-in. steel constitute the principal points of the construction. The car bodies are mounted on Brill No. 177-E trucks. These are equipped with twin links and the approved type of Brill automatic mechanical slack adjuster.

The cars are 42 ft. 1½ in. long, 8 ft. 4 in. wide, and 10 ft. high, from rail to trolley base. The bolster centers are 19 ft. 4 in. apart, and the trucks have a wheelbase of 5 ft. 4 in. The total weight of the car is 36,640 lb. Other dimensions and specifications are summarized in the accompanying table.




**Side elevation and floor plan of the Wilmington car, showing the seating arrangement and the principal dimensions**

### Company Serves Industrial District

The Delaware Electric Power Company not only serves the city of Wilmington, Del., but also Chester, an industrial city in Pennsylvania. The two cities are 13 miles apart, but their industrial activities have spread over large

**Summarized Specifications of the Ten Delaware Electric Power Company Cars, Built by Brill**

| Weights | |
|---|---|
| Car body | 17,300 lb. |
| Trucks | 10,000 lb. |
| Equipment | 9,340 lb. |
| Total | 36,640 lb. |

| Principal Dimensions | |
|---|---|
| Length over bumpers | 42 ft. 1½ in. |
| Length over body posts | 29 ft. 4 in. |
| Bolster centers | 19 ft. 4 in. |
| Truck wheelbase | 5 ft. 4 in. |
| Width over side sheets | 8 ft. 4 in. |
| Width of aisle | 24 in. |
| Width of seats | 35 in. |
| Seat spacing | 30 in. |
| Window post spacing | 41 in. |
| Height, rail to trolley base | 10 ft. 0 in. |
| Height, rail to platform | 15½ in. |
| Height, platform to car floor | 13 in. |

| Equipment Details | |
|---|---|
| Air brakes | Westinghouse |
| Armature bearings | Plain |
| Axles | Brill |
| Body | Semi-steel |
| Car signal system | Faraday high-voltage |
| Compressors | Westinghouse DH-16 |
| Conduit | Flexible |
| Control | K-35 J.J. |
| Destination signs | Hunter |
| Doors | End, folding |
| Door mechanism | National Pneumatic |
| Finish | Enamel |
| Floor covering | Flexolith |
| Gears and pinions | Noiseless |
| Glass | Non-shatterable |
| Hand brakes | Peacock staffless |
| Heat insulating material | Celotex |
| Heaters | Consolidated truss plank |
| Headlights | Keystone |
| Headlining | Agasote |
| Interior trim | Light mahogany |
| Journal bearings | Plain |
| Journal boxes | Brill M.C.B. |
| Lamp fixtures | Ivanhoe indirect dome |
| Motors | Four 35-hp., outside hung; Westinghouse 510 and General Electric 265 |
| Painting scheme | Orange, cream and red |
| Roof | Arch |
| Roof material | Haskelite veneer |
| Sash fixtures | Curtain Supply Company |
| Seats | Brill No. 201-D, reversible |
| Seating material | Genuine leather |
| Slack adjusters | Brill mechanical |
| Step treads | Norton |
| Trolley base | Ohio Brass |
| Trolley catchers | Earll |
| Trolley wheels | Feist Ohio Brass |
| Trucks | Brill No. 177-E |
| Ventilators | Brill exhaust |
| Wheels | Standard Steel, 26-in. diameter |



**The longitudinal corner seats and the cross seats are all upholstered in brown genuine leather and have deep spring cushions**



**The various operating devices are concealed in a neat mahogany finished equipment cabinet**

areas and the territory served by the railway now is essentially one large manufacturing district. The company has steadily increased its service in accordance with the needs, and has paid particular attention to co-ordinating its buses and rail cars. During the year 1927, a total of 37,000,000 passengers were carried by the company's railway system, and 4,000,000 passengers were carried on its bus lines.

In addition to strictly city service in Wilmington and Chester, the railway lines of the company also provide service over two separate routes between Chester and Philadelphia. The rail service south of Wilmington extends to Delaware City, where the United States government quarters a large contingent of soldiers at Fort du Pont. The railway lines serve Deemer Beach on the Delaware River and Shellpot Park, owned by the company and located in Wilmington.

The bus lines of the company have been instituted to extend the scope of the company's service, in answer to steady demands for increased service. They not only reach Newark, Del., and Glen Riddle and Broomall in Pennsylvania, but also join New Castle, Del., and Media, Pa., by a route passing through both Wilmington and Chester.

## Modern Equipment Lowers Maintenance Costs

By H. S. Williams
*Assistant Superintendent of Equipment*
*Department of Street Railways, Detroit, Mich.*

When the subject of classifications for replacement of old cars with new ones arises, the question is raised as to the relative cost of maintenance of various types of car equipment and it is at these times that data on this subject become of utmost importance. Through several years the Department of Street Railways, Detroit, Mich., has kept maintenance costs by car groups. On this property there are three distinct groups of cars, one being the single-truck Birney car, the second a modern type Peter Witt car, and the third an older type comprising miscellaneous steel and wooden cars of relatively high weight, all of the latter being double truck.

The costs per car-mile of the maintenance group of accounts for these cars for the years 1925, 1926 and 1927 are shown in the accompanying table. To make the data of real value they should be supplemented with other figures such as the weighted average age, the weighted average weight, and the average seating capacity.

MAINTENANCE DATA AND COSTS FOR 1925, 1926 AND 1927

| | Birney | Peter Witt | Misc. |
|---|---|---|---|
| Weighted average age—years | 7 | 4.73 | 10 |
| Weighted average weight—pounds | 16,000 | 36,500 | 37,800 |
| Average seating capacity | 32 | 52 | 40 |

| Maintenance Cost per Car-Mile | | Maintenance Cost per Seat-Mile | |
|---|---|---|---|
| Birney | $0.0153 | Birney | $0.000478 |
| Peter Witt | 0.0262 | Peter Witt | 0.000504 |
| Miscellaneous group | 0.0341 | Miscellaneous group | 0.000711 |

By converting these figures to costs per seat-mile they are made more strictly comparable. On this basis the old type equipment costs 41 per cent more to maintain than the modern type of car. It is also to be noted that during the first two years of life of the Birney and Peter Witt types of cars their maintenance was less than half of the amount mentioned.

## Garage Facilities Increased in Akron

### Complete inspection and overhaul terminal added by the N.O.P.&L. to accommodate fleet of twin coaches

With the addition of a number of new Twin Coaches to the company's fleet of buses, it became imperative for the Northern Ohio Power & Light Company in Akron to secure more garage facilities. The company solved the problem by converting a practically new carhouse into a bus garage. Only a few alterations to the building were necessary to make it a complete bus inspection and overhaul terminal.

The structure, which is 76 ft. wide and 130 ft. long, is of face brick exterior with hollow tile walls and an arched roof, supported with cross-girder construction and uniformly spaced reinforced concrete columns. The building is equipped with steel curtain roll doors at both ends which divide both entrance and exit into four portals. Through each of these four doorways a track runs the length of the building over car repair pits, designed with generous widths and depths for the overhaul of electric railway equipment. Both sides of the building have a number of large metal frame windows. Offices and storerooms, however, utilize all the outdoor



Interior of the Brittain garage in Akron, recently remodeled to accommodate a new fleet of Twin Coaches



One of the car repair pits was left open for bus inspection and repair. The others will be opened as the need occasions

illumination on the one side of the garage. Steam radiators are mounted overhead at uniform spacings and have a heating capacity sufficient to withstand the severest weather. A great many industrial type white enameled lighting reflectors are suspended in the garage and supply adequate illumination for the ordinary routine tasks..

Three of the car repair pits have been boarded over with heavy planks for the present, while the fourth pit has been slightly remodeled to permit its use for bus work. Five-inch angle irons have been superimposed upon the rails to serve as guides for the buses as they are run over the pit. Actual experience with this form of guide rail has dictated the bracing of the angle iron at frequent intervals throughout the length of the pit with ½x4-in. irons reaching from the bottom of the pit to the under side of the angle pieces.

The bus repair pit is equipped with air lines and several connections for electric light extension cords. Since the length of the pit is nearly equal to that of the building proper, the inspection and lubrication of several buses can be carried on simultaneously. While only one of the four car pits is being utilized at the present time for bus maintenance, the three remaining track pits being boarded over, it is contemplated in the near future to open one or more of these pits as the demand for additional servicing facilities for the buses increases. The floor area available for buses measures 59x127 ft.

Near the front entrance of the garage, on the side where the offices are located, are the gasoline filling pumps and the oil reservoirs. These reservoirs not only provide the fresh oil supply, but have a drainage vat for the disposal to an underground tank of the old oil as it is removed from the bus crankcase. The old oil so stored is later removed for reconditioning.

Inasmuch as the bus garage is supplied with a concrete floor the buses can be washed almost anywhere, but special piping for the water for this purpose has been made at the end of the building farthest removed from the oil storage and gasoline pumps.

## New Six Wheel Buses in Berlin

THE first few buses of the 100 recently ordered by the Berlin General Omnibus Company have been placed in service. It is expected that all will be in operation by the first part of 1929. The new bus is of the six-wheel deck type and has room on the lower deck for 28 passengers, and on the upper deck for 32 seated passengers. In addition, there is space for fourteen standing passengers. The seats on the upper deck are upholstered and the steps leading to the upper deck are under cover.

## Smyrna Modernizing Its Transportation System



Smyrna, which was destroyed by fire during the conflict between the Turks and the Greeks in 1922, is now being rebuilt and being made one of the most modern cities of the world. Improved transportation is considered necessary. To the left of this view will be seen a horse car of the type now being abandoned. At the right of the horse car may be seen the successor to the old vehicles, modern electric cars, not unlike those in use in this country. Photograph from Wide World Photos.



Single-truck car of Kansas City Public Service Company converted into a meter-testing laboratory

## Kansas City Builds Test Car to

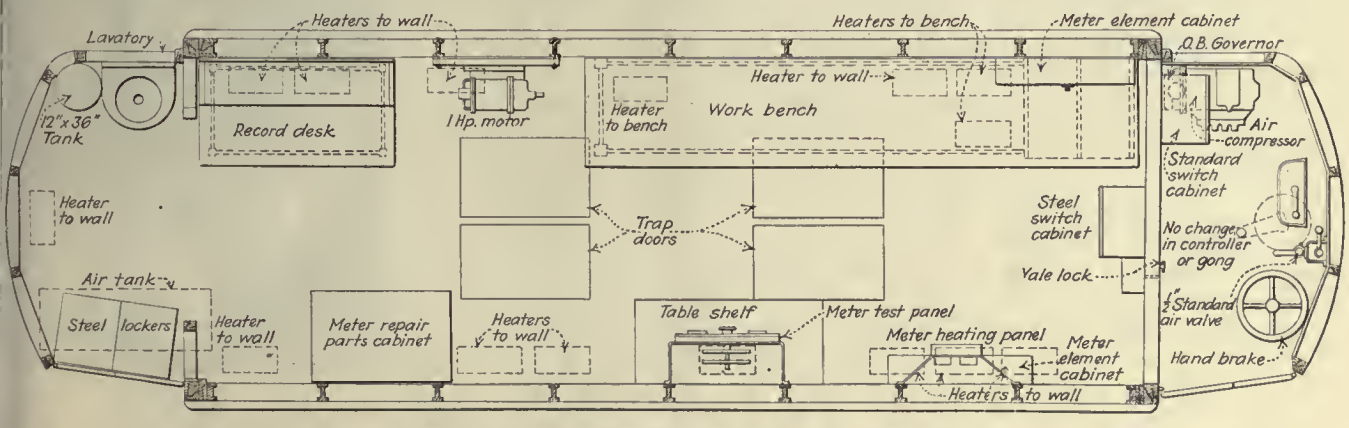
# Maintain Energy Consumption Meters

**Mobility of this laboratory permits testing meters at carhouses and saves time and expense of transportation to central point. All necessary equipment is provided for repairing and calibrating meters**

*By R. L. Reynolds*
Superintendent of Traffic Kansas City Public Service Company

AT KANSAS CITY the street railway has been a user of energy-saving devices since July, 1917. During December last year 746 Economy kilowatt-hour meters were installed. The organization for handling the power conservation program through the Economy meters functions as a division of the transportation department, with a supervisor in charge. All instructions to trainmen, reports, records and maintenance of the meters, are handled through the car meter department and with the division superintendents. It is thought that by having all this work done under the supervision of the transportation head a better efficiency is secured, as closer co-operation is obtained between the car meter department and the division superintendents and trainmen than would be if the supervision of the meter operation was outside the transportation department.

With the installation of the meters came the necessity




Plan of the car showing the arrangement of equipment

of a testing laboratory. The kilowatt-hour meter is an accurate energy measuring device, and in order to derive the benefits it affords the meter must be maintained and calibrated on regular schedule. There must also be "trouble shooting" for the meters which get out of order before their regular test period. These things are doubly necessary, for not only must a true record be kept of the periodic energy consumption of each run, line, and of the system as a whole, but the faith of the trainmen must be maintained in the ability of the meters to give them credit for their power-saving efforts; as without the trainmen's confidence, very little would be accomplished toward the end desired.

When it came to the question of the type of laboratory to be installed, the fact that one on wheels could be taken to the meters much more readily than the meters could be taken to the laboratory was self-evident, and a meter test car was built to take care of this part of the power-saving work. It was built at the Kansas City Public Service Company's Tenth and Lister Street shops from a two-motor, single-truck car taken from passenger service.

The car was one of the few on the system still operated without air brakes. As it went through the shops this feature was added. The front vestibule, of the inclosed type, is made accessible at all times for the purpose of moving the car about, but other windows are heavily guarded and the remainder of the car is kept locked when not in use, so that the apparatus inside may be protected.

The interior of the car is finished with the upper half white and the lower a Pullman gray. All wiring is done in conduit, and so arranged that circuits not necessary for moving the car can be cut off by a master switch just inside the car door. An Economy meter is used to measure the power utilized by the entire unit. This last item is in connection with the policy of attempting to account for all energy consumed on the property, and segregating it according to character of service.

The laboratory is made up of a work bench with its accessories, the meter element cabinets, the spare parts cabinet, the record desk, a generator battery unit, the element heating panel, and the meter test panel. In addition to these things there are two steel lockers and a lavatory with water storage, for the testers' use. The water storage is in a 20-gal. tank, provided with piping arranged to replenish the water supply through an outside hose connection.

### Equipment Arranged for Convenience of Meter Tester

Convenience of the meter tester was considered in the locating of each piece of equipment. All work of taking down the meter, cleaning and reassembling it, is done at one end of the work bench. As the elements are brought in they are placed on an open rack at the back of the bench, and within easy reach are the cleaning lathe, the assembly chuck, a vice, air hose, and the drawers for tools, fresh mercury supply, cleaning rags, etc. Air used for blowing dust and particles from the meters is taken directly from the air-brake storage tank through a Romort air gun. The cleaning lathe is a double-end jewelers lathe with one end partly shrouded, enough opening being left, of course, to get the meter parts into the buffing brush where the mercury is cleaned from them, the mercury and foreign matter falling into a hopper under the shroud. An exhaust fan draws air through the shroud and over a set of baffle plates in the hopper which separates the dust from the mercury. The dust is exhausted outside the car while the heavy mercury draws to the bottom into a porcelain receptacle. As this mercury accumulates, it is reclaimed for further use by a nitric acid process at the company's chemical laboratory.



**Inside view of the test car as seen from the rear**

A small drill press and grinder placed at the opposite end of the bench are not used so frequently as the other tools, but are found to be almost indispensable at times. This end of the bench was also found to be a convenient location for the 6-volt generator. All rotating machinery is driven by line shaft from a 1-hp., 550-volt motor, with the line shaft running beneath the table.

Directly across from where the elements are cleaned is the meter heating panel. After the meters have been cleaned and assembled they are put on the heating panel to warm, as it was found that a meter tested "cold" against a "warm" standard will not show the same calibration which it would if both meters were warm, due to the fact the resistance of the voltage coil changes slightly with the change in temperature. The difference introduced is not great, but in order to overcome a known error all voltage circuits are warmed to the normal operating temperature before the calibration is made. Since the change of resistance of the current circuit is not discernible and has no effect on the current following through it, this part of the meter is not heated. The heating panel has a capacity of four meters. The meter calibrating or test panel, as well as the heating panel, is made of Transite board, the test panel being mounted above a bench with a clearance room for an element to lie on the bench top be-



**View of the element heating panel where voltage coils on the elements are heated before being calibrated**

neath it. Instruments on the board include an 0–15 ammeter, an 0–750 voltmeter, an inclosed Tumbell safety switch for the 600-volt circuit, and an open knife switch for the current circuit. A 7.5-ohm rheostat for current regulation is mounted at the back, with the control knob extending through to the front. Two meters can be calibrated on the panel simultaneously. The working standard is in the lower center portion of the board with an arrangement on either side for the meters to be tested. It is not necessary, however, to calibrate two meters at the same time, as either of the side units can be cut out by shorting across the current terminals of that part, using only the other side. External resistances for the three meters are on the back of the board immediately behind the elements. Binding posts for the elements on test were designed to facilitate mounting these meters, the current contacts being clamped down with wing nuts and the voltage terminals held by spring studs. The test board is adjacent to the heating panel.

The three-meter scheme has proved quite practical for checking the master meters. Two stand-by standards are retained which are checked together with the working standard each morning. These are all stock meters kept apart for this purpose.

As the meters are calibrated they are placed in a twelve-meter cabinet just under the heating panel. A similar cabinet is located over the work bench for storing damaged meters until such time as they are repaired.

### Automobile Type Generator Used for 6-Volt Circuit

Current for the test board is provided by a 6-volt generator-battery combination. A motor-generator set was specified in the original design to supply the current, but further investigation developed the fact that a 550-volt motor-generator set for a job of this kind would cost more than it was thought advisable to put into one. As a substitute, a Bosch automobile-type battery charging generator was installed, driven from the line shaft, and the substitute has proved very satisfactory. A 210-amp.-hr., heavy-duty Exide storage battery which provides the necessary reserve, is located directly under the test board in order to reduce the voltage drop to the panel. The generator, being of the automobile type, has an automatic cut-out, eliminating the possibility of the battery feeding back into the generator while it is standing idle.

Two file drawers and three stationery compartments placed at the back of a flat-topped table makes up the record desk. It is here the meter tester keeps his records of the repairs made and meters tested. The spare parts cabinet contains a chest of divided drawers with a large compartment for more bulky materials in the bottom.

The meters are cleaned and calibrated on a schedule that requires the meter tester to make the rounds once in each nine months. In doing this the car is moved to a division where it will remain until all meters at that station have been taken care of. If meters at other divisions are reported as being in bad order the tester replaces them with O.K. elements, and brings the ones replaced back to the car where they are worked over and put into condition for use. When on routine work, the program for the day is made out the evening before and handed to the car placer, who will have those cars run onto a specified track the next morning, ready for the meters to be changed. The meter tester will then replace the elements on these cars with those which he has calibrated the day before, making sure that all register readings are identical with the ones being replaced to insure a continuity of the dial readings. This being done he devotes the remainder of the day to work on these elements at the meter car.

To provide for the needs of the various weights and types of passenger equipment on the property, it was necessary to install meters of five different capacity ratings. The motor elements are all interchangeable, but the register or trains are not, as the ratio of the gear trains vary with the different values of shunts, and anyone handling the meters must take precaution to see that the trains are placed in meters of a like rating.

# More Bus Items Needed to Balance Contest

BUS maintenance is not receiving the attention that it merits in the items submitted in Electric Railway Journal's Maintenance Contest. The number of buses in service on electric railway properties has increased rapidly, the problems encountered are new, and much of value can be gained by a broad discussion of them.

Whenever a group of maintenance men assemble discussion of the new bus problems is lively. Other men are experiencing the same difficulties that you are, and when you find a satisfactory solution or an economical method you can assist many other men by passing on the information. Let us have a more extended discussion of this maintenance work.

Contest items are coming in rapidly now. Jan. 15, 1929, is the closing date for the first group of material to be passed on by the judges for the first four departmental prizes of $25 each. The greatest volume of material sent in so far is from the rolling stock and shops and the way and structures departments. Men in the electrical and line and buses and garage departments have a great opportunity to make a good showing by sending in material early. Go over the rules of the contest as published in Electric Railway Journal for Oct. 27, or send for an instruction folder.

$200 for the best maintenance idea submitted.

$300 to be distributed in twelve departmental prizes of $25 each.

A company trophy to be awarded for the greatest contribution to the improvement of maintenance practices, as shown by all items submitted from any particular property.

Departmental certificates of merit to each of the four departments making the best individual showing in the contest.



Digging the trenchway for the foundation of new track at Vancouver, Canada



After the steam shovel had finished its work. The 19-ft. trench is now ready for the concrete base



Pouring the concrete for the slab foundation



As the completed concrete slab foundation appeared

# Permanent Track Laid in Vancouver

## More than $390,000 being expended by British Columbia Electric Railway in constructing new track and replacing temporary rail structures with permanent track

EXTENSIVE construction work has been carried out by the British Columbia Electric Railway on its street car tracks in Vancouver during the last nine months. The work completed included relaying of permanent double tracks on Broadway West, from Granville to Trafalgar Streets, relaying of double paved tracks on Hastings Street East from Boundary Road to Renfrew Street, and construction of new tracks on Clark Drive from Hastings Street East to Venables Street. The existing track on the Hastings Extension line was also replaced to permit paving of road by the city. The approximate cost of these five projects was $290,000.

In addition to the above work, which was completed some months ago, the company's workmen have just finished replacing temporary tracks in Alma Road with permanent double tracks. This work cost approximately $13,000. Another project just completed was the relaying of tracks from Cordova to Hastings Streets on Granville Street. This job was done under traffic, and without diverting cars by another route. The rails in this section were laid in 1907 and are still good according to examination reports after removal. It was feared, however, that they would not outlast another paving which the city proposed laying, and accordingly it was decided to replace this track with heavier rail.

Construction gangs are now engaged in relaying the tracks on Pender Street West, and this job is estimated to cost $75,000. In this case also, similar conditions exist to those on Granville Street, as the track is not worn out, but is believed not to be capable of lasting out a new pavement. A great portion of the track is being laid on existing foundations.

### Permanent Track Laid on New Jobs

The policy of the company for the past few years has been to lay permanent tracks on all new jobs, and to replace such temporary track as is necessary with permanent construction work. A typical example of the method followed by the company in relaying tracks, or constructing an extension line, is the work completed at Alma Road. T-rails, weighing 93 lb. to the yard and 62 ft. long were used in this construction. A steam shovel was employed in digging a trench 19 ft. wide, which was trimmed to a depth of 20½ in. Form boards were placed on each side 18 ft. apart, set up to grade and lined up ready for the concrete slab foundation. The concrete slab, when finished, was 18 ft. 6 in. wide, and 6 in. thick. Fir ties were spaced 2 ft. apart, and ⅜-in. steel tie plates were placed in position on these.

The rails used were 7 in. high and 62 ft. long to reduce joint maintenance and give long wear. Tierods were inserted 8 ft. apart. Common planing mill ends were used as shims under each end of the tie to bring the rails to grade. The shims bring the ties up to about 1 in. above the concrete foundation slab, and this space was tamped tightly with a mixture of coarse sand and cement.

After the steel had been properly surfaced and aligned, a second concrete gang filled concrete around ties and base of the rails, covering the whole substructure of the track to a depth of about 1 in. above the ties. The mixer was provided with flanged wheels and moved on rails in advance of the work.

Concrete was carefully tamped to eliminate pockets under the rails, and was struck to a uniform surface of 6½ in. below street level. In Vancouver, the usual paving practice is to use stone header blocks along rails and pave with concrete or asphalt. About 2¼ tons of concrete, steel, and pavement went into each linear foot of double track and the cost to the company was approximately $20 per foot.

### Manganese Steel Used Extensively

The company also has made a practice of using the specially hardened manganese steel for curves at such points where the traffic is sufficiently heavy to justify the extra expense. At one of the downtown corners in the company's system in Vancouver the curves are of open-hearth steel and wear out every three or four years, while at another corner where there is even greater traffic, manganese curves have been in service since 1912 and are not yet worn out. All switches, frogs and crossings are made of manganese steel. Owing to the growing weight of traffic, much more specially hardened steel is being used now than in the past. Though this steel costs more it is the least expensive when used over a period of years as for track.

In addition to this track laying work, the maintenance-of-way department is constructing an elaborate wye at the turning back point on the Hastings Street East line. Formerly, cars wyeing at this point had to turn up a steep hill and then back down again on to Hastings Street. This hill has now been cut away by steam shovels, and a pit made in the hill, level with Hastings Street and long enough to hold a two-car train with ease. A concrete retaining wall is being built around the sides of this pit and a paved road surface laid down between and around the tracks. Ornamental light standards will be erected on the top of the structure when completed. This work is estimated to cost around $13,000.



Tamping the sand cushion under the assembled track



The track was brought to grade by inserting shims under the ties and the rails aligned before pouring concrete



Concrete was poured around the ties and base, covering the substructure to a depth of 1-in. above the ties



Section of completed track, ready for the street paving

## Strathcona Memorial Fellowships in Transportation

YALE UNIVERSITY has issued a notice calling attention to the five Strathcona memorial fellowships of $1,000 each, which are available annually for advanced work in transportation. The holder of one of these fellowships is entitled to pursue investigation in any aspect of transportation in which the university offers competent guidance and supervision, whether along engineering, economic or legal lines. There are many such courses. The holder must have obtained his first degree from an institution of high standing. In making the award, preference is given, in accordance with the will of Lord Strathcona, to such persons or to sons of such persons as have been, for at least two years, connected in some manner with the railways of the Northwest.

Applications for these fellowshps for the coming year should be addressed to the Dean of the Graduate School of Yale University, New Haven, Conn., before March 1, on blanks which may be obtained from him.

# Detroit Extends Surface Rapid Transit System

**Street cars now operating on express schedules on Grand River Avenue. Local buses supplement 18 m.p.h. car service. Automatic signals facilitate movement of traffic**




**A two-car train at the downtown terminal of the Grand River express line**

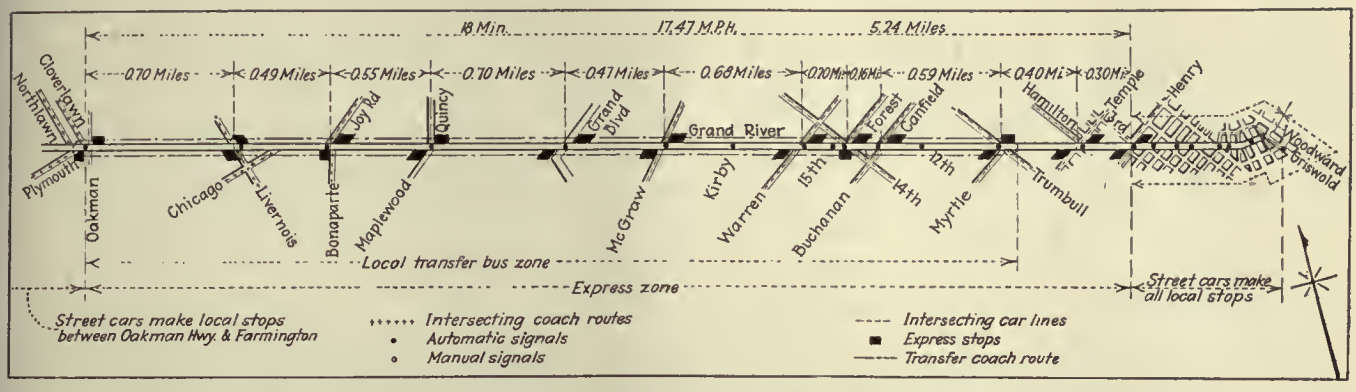
WITH more than a year of experience in the operation of express street car service on the Jefferson Avenue line, the city of Detroit has now inaugurated a similar service on Grand River Avenue. This plan of express service was originally adopted on Jefferson Avenue as an experiment to increase the speed and efficiency of surface transportation on heavy traffic arteries. Cars were operated on an express schedule of 18 m.p.h., making only five stops in a distance of 4.15 miles. Buses handled the local passenger traffic, stopping at each street intersection. Free transfers between the two vehicles enabled passengers originating between express stops to board transfer coaches at the nearest street and transfer to express street cars at the first express station. Prior to the introduction of the express service the cars running on Jefferson Avenue made about six stops to the mile outside of the business district and the schedule speed on the line was less than 12 m.p.h.

This method of operation became so popular that on Aug. 19, 1928, it was extended to the Grand River Avenue route starting with the establishment of an area between Henry Street and Joy Road with express cars stopping at the six intervening streets. On Oct. 3 the express area was extended to Oakman Boulevard with only one stop between that point and Joy Road. Local buses operating in this area make stops at all intersecting streets and deliver passengers to and from the express stations.

### Express Service Saves Much Time

Cars operate to the express area from Henry Street to Oakman Boulevard, a distance of 5.24 miles, in 18 minutes or at a speed of 17.47 m.p.h. In the downtown congested business districts the cars make all of the local stops. A saving of seven minutes is reflected over the entire route of the Grand River line west of Oakman Boulevard. It formerly required 32 minutes to travel on the street car from Oakman Boulevard to Capitol Park, a distance of approximately 6 miles, but under express service this run is now made in 25 minutes. In addition to providing a faster service to the traveling public, express service has materially helped to accelerate the movement of vehicular traffic by reason of the elimination of many street car stops where vehicles were formerly required to stop behind a standing street car.

Buses give local service from Trumbull Street near the downtown end of the express area to the last outbound express stop at Oakman Boulevard. The distance traveled by the local buses is 4.54 miles. The local buses pick up passengers between express stops, or carry them to local stops after they have transferred from express cars.




**Route of Grand River Avenue express lines, showing location of stops and signals. The local buses terminate at Trumbull Street and Oakman Boulevard**

Figures are now available upon which to base an accurate comparison of results of operation on Grand River Avenue before and after the inauguration of express service. An analysis of these figures reveals that during the week before express service was started on Grand River Avenue, average daily operating receipts were $3,437.48 and the average daily operating expenses were $3,038.58, thus making a daily average net of $398.90. These figures are from Aug. 13 to 17 inclusive. For the period from Oct. 8 to 12, after the express service was started, the daily average operating receipts from street cars was $3,798.82 and the expenses were $3,332.41, showing a daily net profit of $466.41, or an average daily gain of $67.51. However, during the same period the average daily receipts from the coaches were $278.65, while the coach expenses were $466.64, thus showing a daily loss of $187.99 in coach operation. The net revenue from both coach and rail operation under express service was $278.42, or $128.48 less than the daily net revenue as shown for the period just prior to express operation.

Only from 10 to 15 per cent of the passengers on the Grand River line take advantage of the transfer facilities. By far the majority take either the car alone or the coach alone. As the system is operated, free transfers are given from the transfer coach to the express trolleys, while passengers transferring to intersecting lines pay only 1 cent for their transfer. Many more passengers transfer from car to coach than vise versa. The purpose of the bus operation is to provide another facility, which is taken advantage of by most of the passengers for a complete ride. This means naturally that the bus service must be kept well within bounds or otherwise the combined operation will show a loss.

## Automatic Signal Devices Helpful

Traffic on Grand River Avenue, as well as on Jefferson Avenue, is now controlled by automatic traffic signal devices which favor the movement of cars at the same time expediting the movement of all vehicles on the street. The control consists of a combination of five relays connected in the circuit between the automatic timer and the signal head of a trolley traffic signal, and controlled by two trolley contactors on each trolley wire.

The normal position of the device is such that the automatic timer of the traffic signal controls the periods of the red and green lights, and when the street car operates the so-called "on" contactor, this device holds the green light on the railway side of the traffic signal until it is again released by the street car passing the

DAILY AVERAGE FIGURES, GRAND RIVER EXPRESS SEVICE

| | Cars | | Coaches, | Combined Operation Car and Coach, |
|---|---|---|---|---|
| | Aug. 13-17 | Oct. 8-12 | Oct. 8-12 | Oct. 8-12 |
| Miles | 9,822.64 | 11,202.97 | 1,740.40 | 12,943.37 |
| Revenue | $3,437.48 | $3,798.82 | $278.65 | $4,077.47 |
| Expense | $3,038.58 | $3,332.41 | $466.64 | $3,799.05 |
| Net revenue | $398.90 | $466.41 | *$187.99 | $278.42 |
| Revenue passengers | 56,151 | 61,950 | 4,476 | 66,426 |
| Transfer passengers | 21,267 | 23,429 | 1,041 | 24,470 |
| Free transfers | ..... | 1,209 | 781 | 1,990 |
| Total passengers | 77,418 | 86,588 | 6,298 | 92,886 |

* Daily loss.



**The bus drives to the left of the station while all other vehicles must pass to the right. Both car and bus wait for the interchange of passengers from one unit to the other**

"off" contactor, when the device again assumes its normal position. The principal of operation of this device is to hold the green light on the railway side of the traffic signal without in any way interfering with the operation of the automatic timer, which is electrically interconnected with all other signals on the avenues through a master timer.

### Traffic Device Operated by Cars

The "on" contactor is located at a suitable distance from the traffic signal, so that when an approaching street car passes under the contactor the operation of the device will hold the green light, if it should be lighted at the time the car passes under the contactor. On the other hand, if the red light is lighted when the car passes under the contactor the normal time period of the red light is prolonged so that the signal will change to "go" at approximately the same time the car reaches the corner.

During the peak hours the headway is so short that cars would pass the traffic signal at such frequent intervals that they would cause the green light on the railway side to remain lighted continuously and thereby interfere with cross traffic. To overcome this objection one of the relays of the combination has a time element adjustable from approximately one second to 30 minutes. This time relay is so connected in the circuit that when cars pass the traffic signal in the normal green period this relay does not function. However, if the operation of the cars is such that the green signal is kept lighted continuously for a period corresponding to the setting of this time relay, it will automatically disconnect the trolley contactors from the circuit at the end of its period and allow the automatic timer of the traffic signal to change the light from green to red for one normal period, after which time the cycle may again be repeated.

By this means it is possible to increase the period of green on the railway traffic from the normal period of the timer to any desired period. On Jefferson Avenue the time has been set for two minutes and 45 seconds. This was derived after a number of experiments and was found to allow practically all of the cars to pass without being delayed, at the same time not unduly obstructing cross traffic.

EQUIPMENT REQUIRED—DETROIT EXPRESS ROUTES

| | One Way Route-miles | A.M. | Base | P.M. |
|---|---|---|---|---|
| Grand River cars | 11.0 | 94 (42 trailers) | 35 | 100 (46 trailers) |
| Grand River buses | 5.25 | 18 | 9 | 18 |
| Jefferson cars | 6.76 | 71 (15 trailers) | 16 | 51 (9 trailers) |
| Jefferson buses | 4.15 | 33 | 15 | 43 |

Buses only operate through express zones.
Cars operate to city limits.

### Sheltered Safety Zones Erected

The safety zones at the express stops are the standard type used in Detroit, being 88 ft. long with upright stanchions 6½ ft. from the track and placed about 8 ft. apart. Canvas awnings over the safety zones and splash guards around the side have been erected to afford shelter for the passengers transferring between the local buses and express cars.

The buses pick up and discharge local passengers at the curb. At the express stations all vehicular traffic, with the exception of the motor buses, is compelled to drive to the right of the station. The buses run inside the safety zone, receiving and discharging passengers directly into the zone. Should a car and bus approach the station at the same time, the car is given the preference, but both the car and bus wait for the interchange of passengers from one unit to the other.

The average number of passengers carried per day by the combined operation of cars and motor coaches on the Grand River express service is 92,886, compared with 77,418 passengers per day carried by the cars before the express service was inaugurated. It is evident that the Grand River express service is meeting with the same public favor as that shown on the Jefferson Avenue line, and it is planned to extend the express area beyond its present limitations as soon as the work of constructing new tracks on Grand River Avenue is completed.

## All Mechanism Above Ground in New Crossing Gate

AN IMPROVED type of overhead cable-operated safety gate for grade crossings has been developed by the Chicago Rapid Transit Company and is now being given a test at the Sacramento Avenue crossing on the Ravenswood branch of the North Side division. Constructed by one of the Rapid Transit signal engineers, this new gate eliminates all sub-surface construction work. An overhead steel frame, consisting of five upright beams 22½ ft. high and one cross-span, carries the cables connecting the gate arms with the levers in the operating shelter. The gates are of the two-cable construction. There are two levers, each controlling the gate arms on one side of the crossing.



**Sub-surface construction work is unnecessary in this new type of crossing gate developed by Chicago Rapid Transit Company**

The principal feature making this new gate an improvement over other manually-operated types lies in its greater operating efficiency. The gate arms can be stopped almost instantaneously at any position when being raised or lowered. Another factor that makes for greater grade crossing protection is the elimination of all danger of the cables freezing in cold weather, which frequently happens when the control apparatus is underground. Maintenance costs also are reduced by the new gate, due to its simplicity of construction, according to Rapid Transit engineers.

# Liverpool Builds New Shops

## Attractiveness of exterior and completeness of interior equipment for car repair are characteristics of the new plant of the Corporation Tramways



This building houses the new shops of the Liverpool Corporation Tramways

DESIGNED as it is in the classical renaissance style, with brick façade, stone pilasters, trim and set in a park, the attractive building pictured above might be taken by an observer, at first sight, to be a public school or State Capitol. Actually, it is a repair shop, just erected by the Liverpool Corporation Tramways for the maintenance of its cars and buses. The foundation stone was laid on May 17, 1926, and the official opening took place only on Oct. 17, 1928. The ground on which the shops are located comprises 15 acres. The building itself covers 7 acres, not including a carhouse, which has been built on one side of the plot and which covers more than 1 acre.

The front of the shops, as explained, is of brick, and the side and back elevation of reinforced concrete. The interior walls are also of reinforced concrete, finished with whitewash.

The main building is set 114 ft. back from the street on which it fronts; it has a frontage of 600 ft. and extends back a similar distance. In front, at the center, is the administrative block, containing offices, drafting rooms, lecture room, etc. On the second floor are dining rooms to accommodate the 800 employees, together with kitchen, etc. In the rear of the administrative block is a glass-roofed covered passageway, giving access to the shops.

The main area of the shops is divided into bays, extending parallel to the front of the building, with a traverser or transfer table with track extending the entire length of the building in the center. The transfer table is operated by a 25-hp. motor. The carhouse roof is supported on latticed posts set 45 ft. x 44 ft. 6 in. apart. Steam heating is used and the radiators are mounted on these posts, as shown in one of the illustrations.

The roof girders are set higher than might otherwise be the case because of the need of providing for double-deck cars. The roof is braced on all sides for wind and is of the sawtooth type. Boarding and slates are used for the 30-deg. south slope, and wireglass for the north slope.

To the left and immediately inside the main entrance of the plant is the electrical shop. It has a total floor area of 23,670 sq.ft. The electrical test room is situated on a gallery of this shop.

Beyond the electrical shop is the car repair shop, having ten pits, with a total length of 1,760 ft. This shop is equipped with three overhead cranes of the three-motor slip-ring type, and with various machine tools, such as lathes, planers, millers, grinding machines, wheel tire heating apparatus, etc. To the left of these shops and running the full length of the car repair shop is the fitting shop. At the north end of the fitting shop are three electric and one acetylene welding sets. The repair and overhauling shops have an area of 87,750 sq.ft.

Directly beyond the car fitting shop is the blacksmith shop, foundry and pattern shop. The blacksmith shop is fitted with power hammers, power cutting shears, fifteen blacksmith hearths, case hardening ovens, etc. The floor is of beaten ashes. The pattern shop adjoins the brass foundry and has an area of 1,670 sq.ft. The foundry has twelve furnaces, and is equipped with coke ovens with adequate working space for molding. Behind these shops are sand and foundry bins. The blacksmiths' shop has a floor area of 9,900 sq.ft., the pattern shop of 1,670 sq.ft., and the foundry of 3,620 sq.ft.

On the right side of the main entrance is the paint shop, which is self-contained and cut off from the dust from the other shops. It includes a varnish maturing room, bus varnishing room, drying room, etc., as well as a sign painter's gallery. This shop is separately heated to keep an even temperature throughout the year. An air purifying chamber on the west side supplies washed



Some of the tracks in the car bay have pits, others have sunken aisles on each side of the track




The stores department has steel bins which can be used for counters. There also are racks in the gallery

and heated fresh air which is delivered from overhead. This shop has space to deal with 40 cars at any one time. It occupies an area of 32,210 sq.ft. exclusive of the sign painter's gallery, which has an additional area of 4,000 sq.ft.

Beyond the paint shop is the body repair shop, having six pits with an aggregate length of 1,042 ft. This shop has sufficient room for 30 cars, and is equipped with a special hot water supply for use in connection with the periodic washing of cars.

Adjoining the body repair shop is the body building shop. A foreman's office overlooks the body repair and body building shops and the saw mill. In the body building shop 24 cars or motor bus bodies can be dealt with at one time.

Adjoining the body repair and body building shop, but cut off from them by concrete walls and armored doors, is the saw mill. It is top and side lighted, has a wood block floor and is fitted with machines for dealing with timber from the log to the finished product. Dust and shavings are removed through a dust chamber near the outside entrance. The sawmill has an area of 12,400 sq.ft.

The final section on this side of the shop is the storeroom with 109 ft. of counter, and especially selected steel racks to fit the various parts of the equipment of cars and buses. Additional racks for storage on galleries provide an area of 4,500 sq.ft. besides the main area of the storeroom, which is 20,898 sq.ft. Lighting is from above. A railroad track leads up to this building.

Beyond is the store department, and in a separate building is the bus repair shop. It is entirely of reinforced concrete with steel frame and has an asphalt finished floor. It contains a series of inspection pits and is heated from the main building. Adjoining these shops on the left are the gasoline storage tanks, two in number, with a total capacity of 24,000 gal. Pumping equipment permits a delivery of 15 gal. per minute from each tank.

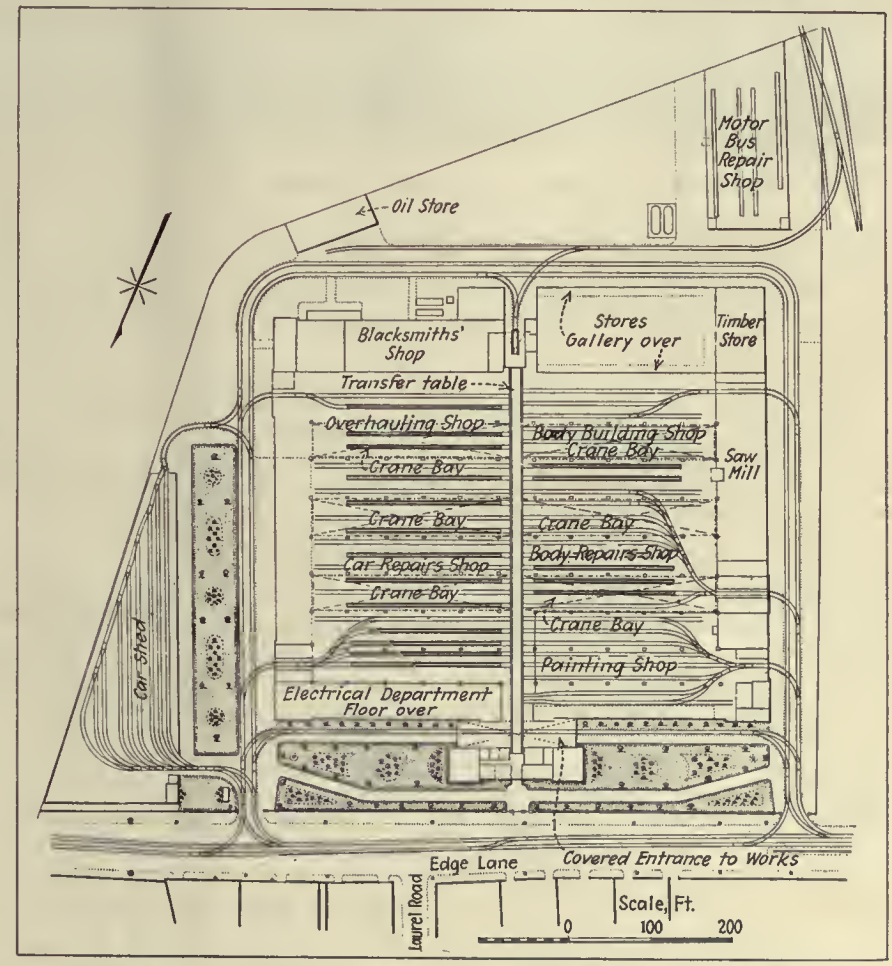
Near to the motor bus shop are the hydraulic gasoline storage tanks which are fed directly from tank cars from the railroad siding. These tanks, which are placed underground, have a capacity of 24,000 gal. The installation is divided into two distinct plants, each giving 15 gal. per minute delivery when all draw-off points are in use.

A 6-in. water main encircles the whole of the main building with a branch taken from the south end down the center of the building under the transfer table way. From these mains 4-in. branches fitted with standpipes serve the entire works, while on the 6-in. mains outside there are hydrants at essential points.

All external doorways at the sides and rear have steel roller shutters for the larger openings, and wood doors for the small openings. The internal entrance ways have steel roller shutters. The car entrances have armor-plated fireproof doors.



**Radiators for the steam heat are attached to the vertical supporting posts**




**This is the floor plan of the new Liverpool Tramway repair shops**

# Commission Orders Crossing Signs

ORDER No. 75 of the California Railroad Commission, dealing with warning devices, is one of the most extensive ever issued by a similar body as regards highway protection. The ruling not only directs that electric interurban and steam carriers shall provide wholesale additional signs and signals at crossings, but indicates the type that shall be erected or installed at specific locations. It also standardizes into four classes the type, size, shape and location that will henceforth be acceptable to the commission. A number of abandonments of former types and relocation of numerous devices were ordered in the cases of several carriers.

Briefly stated, the following are the four standards of protection, outlined in the commission's order early this year:

Standard No. 1 is the common "crossed-arms on post" with black lettering "Railroad Crossing," to be located in a conspicuous position facing highway travel, preferably at either corner of the crossing intersection on the right-hand side of the highway traffic flow and in advance of the railroad track.

Standard No. 2 is a suspended sign with a white X on a black field. This field is 24 in. square. The sign may be used at a crossing in addition to the crossing sign designated as standard No. 1, or in cases approved by the commission, may be installed in lieu thereof. It must be placed in a conspicuous location facing highway traffic and preferably be illuminated during night hours.

Standard No. 3, a wigwag, or automatic flagman, is to be located in a conspicuous position facing highway travel, preferably at either or both of the corners of the crossing intersection on the right-hand side of highway traffic flow and in advance of the railroad track. The warning aspect of the wigwag is a swinging red disk by day, in combination with a swinging red light by night. Unless omitted by special permission of the commission, the warning aspect shall be accompanied by the sounding of a bell. This wigwag is automatic, being started and stopped by trolley or rail contact devices. Installation is at curb.

Standard No. 4 is a wigwag, similar to No. 3, but installed in the center of the highway, on a heavy concrete base.

In addition to these standards, the state law prescribes advance warning signs, 300 ft. on each side of railroad crossings, to be put up by the county or city. This type of sign is circular, with a white cross on a black field, and is set on posts.

While the aggregate expenditure and number of new signs and signals to be installed by all railroads in California under this order is not available, the scope of additional protection may be seen by the manner in which the Pacific Electric Railway, operating in Southern California, is affected. On the lines of this railway, under the order, there are now 298 additional No. 1 crossing signs, 428 suspended No. 2 signs and 96 private crossing signs being erected. Four automatic flagmen are being installed and nine No. 1 crossing signs relocated.

With the exception of the new standard No. 2 the devices in the approved new standards have previously been used in California. A view is presented of this sign in use.



**This new type of warning sign of a crossing is being used extensively in California. It is in addition to other warning devices**

# Government Provides New Form of Transportation Request

ELECTRIC railway companies are urged by the Assistant Comptroller General of the United States to familiarize themselves with the new procedure of the department in regard to the handling of transportation requests. Ticket agents and conductors on interurban lines should be advised regarding the nature and form of the identification cards and requests, so that a government employee traveling on official business would have only to fill in the necessary information and present them to any authorized agent to secure transportation to the value of $1 or more.

*Electric Railway Journal Maintenance Data Sheet*

ROLLING STOCK—MISCELLANEOUS—49

## Emergency Stopping Device for Electric Cars*

By Albert Rivet
*Carpenter Shop Foreman*
*Union Street Railway, New Bedford, Mass.*

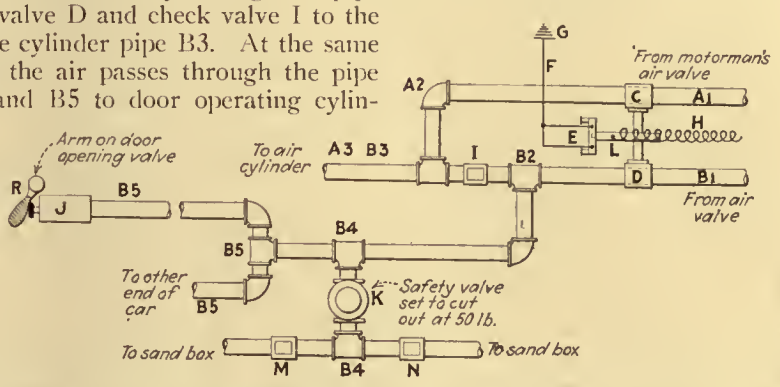
RECENTLY the Union Street Railway, New Bedford, Mass., increased the number of one-man cars in operation. Before inaugurating this service, it was necessary to equip a large number of cars with an emergency stopping device. All of these cars had manually operated doors. It was decided to place the customary pull cord in the center of the car, so that passengers might make an emergency stop. While this method is not new, the mechanical operation and the piping arrangement, was developed along somewhat original lines.

The operation may be followed by referring to the accompanying diagram. When the car is operated in the regular manner, air passes from the motorman's air valve through the pipe A1, valve C, and pipes A2 and A3 to the air cylinder.

To make an emergency stop the passenger can pull the knob G easily. This is attached to the cord F that trips the release catch E. When released the lever L is brought instantaneously into a vertical position by means of the strong spring H. This action closes valve C and opens valve D, so that the air then passes from the air tank directly through the pipe B1, valve D and check valve I to the brake cylinder pipe B3. At the same time the air passes through the pipe B2 and B5 to door operating cylinders and circuit breaker plunger J and also through the pipe B4, safety valve K and check valves M and N to the sand boxes.

When the air operates the piston of the cylinder J, it pushes against the arm R that opens the manually operated doors. The same action cuts off the power circuit.

To reset the apparatus it is necessary only to pull the lever L back down under the release Catch E.




**Equipment and piping arrangement for emergency stopping device as applied to one-man cars of the Union Street Railway**

*Submitted in Electric Railway Journal Prize Contest.*

*Electric Railway Journal Maintenance Data Sheet*

TRACK AND WAY DEPARTMENT—39

## Auxiliary Ground Box for Track Switches*

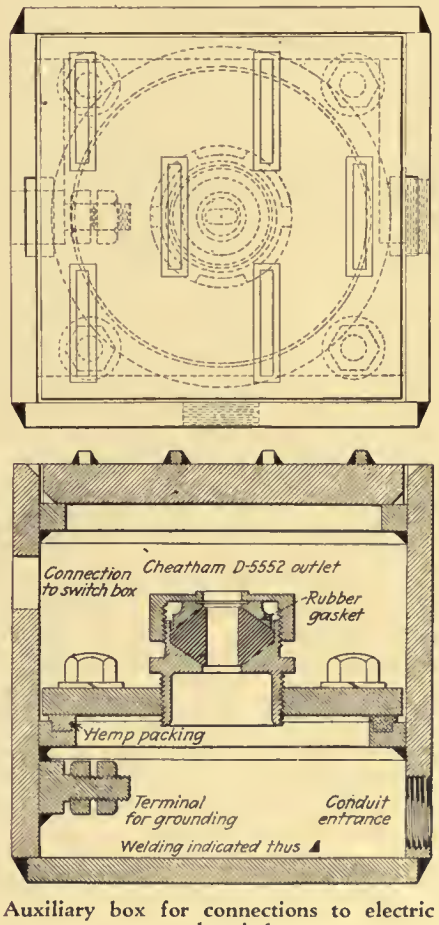
By L. H. McAdam
*Electrical Department*
*Toronto Transportation Commission,*
*Toronto, Canada*

DIFFICULTY has been experienced on lines of the Toronto Transportation Commission with water getting into the conduit which carries wires from poles to track boxes. This water freezes in winter, and in case of trouble on the wires it is necessary to dig up the conduit, which often results in considerable labor.

To overcome this trouble an auxiliary ground box is placed alongside the track box. This is used in making a flexible watertight connection between the circuit changer box located on the pole, and the track box cylinder of an electric track switch. The two-compartment ground box is made of $\frac{1}{2}$-in. steel plate, and is 8 in. square. All joints are welded and the lower section is waterproofed by means of a $\frac{3}{8}$-in. hemp gasket.

The underground wires are extended from the lower chamber through a D-5552 outlet by means of heavily insulated flexible twin cable which connects with the cylinder. A grounding terminal is provided in the lower compartment of the box at one side.

Since these boxes have been installed water is kept out of the conduit, and in case of trouble it is much easier to remove the underground wires. This type of installation also permits the cylinder to be removed readily and with less damage to the connections.




**Auxiliary box for connections to electric track switch**

*Submitted in Electric Railway Journal Prize Contest.*

*Electric Railway Journal Maintenance Data Sheet*

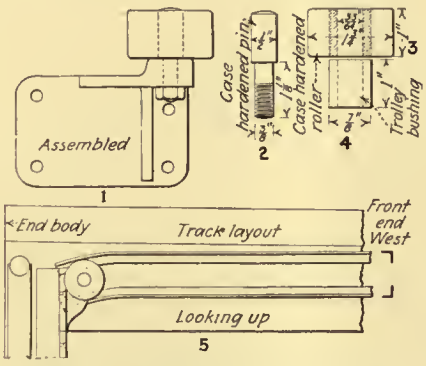
ROLLING STOCK—MISCELLANEOUS—50

# Making Car Doors Operate Faster*

By F. A. Marsh
*Superintendent of Equipment*
*Municipal Railways, St. Petersburg, Fla.*

SCHEDULED speed of an electric car is dependent upon the operation of the slowest piece of equipment. On the Municipal Railways, St. Petersburg, Fla., the slowest device to function was the car doors. As these were interlocked with the controls for safety they must close before the car can start. Hesitation in door operation held up the getaway of the car and was also annoying to both operator and passengers.

To remedy this condition the old small roller in the door hanger was discarded and a case-hardened, graphite and bronze bushed roller 1 in. high by $1\frac{3}{4}$ in. in diameter, turning on a $\frac{1}{2}$-in. case-hardened pin was substituted. By curving the overhead track $\frac{1}{2}$ in. outward, as shown in the accompanying sketch, an additional source of trouble was eliminated, and now a car is seldom turned in or even reported for door trouble. Feist oilless hinges were installed and, together with the trolley bushings in the door roller, they remove the necessity of oiling door mechanism. This saves time and also trouble from oil on the doors.




**Assembly and details of roller and track for car doors**

The cost of these modifications was less than $1 per door. Many have now been in service two years and the saving in cost of pull-ins and detriment to service has already paid the cost of the changes in the mechanism. This method of door roller and track construction has been adopted as standard by the railway, and all future cars purchased will be ordered equipped in this manner.

**Submitted in* Electric Railway Journal *Prize Contest.*

*Electric Railway Journal Maintenance Data Sheet*

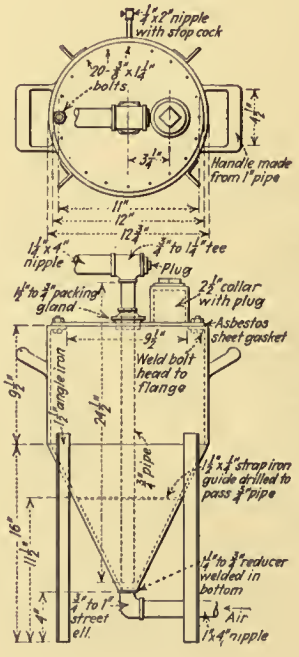
TRACK AND WAY DEPARTMENT—40

# Sand Blasting Ties and Rails Before Welding*

By Louis T. Botto
*Superintendent Maintenance of Way*
*San Antonio Public Service Company,*
*San Antonio, Tex.*

DURING the month of October, 1928, the San Antonio Public Service Company, San Antonio, Tex., reconditioned 2,000 ft. of track with 60-lb. A.S.C.E. rail. For this work the asphalt paving and concrete was removed from both sides of the rails to the top of the steel ties. All tiebolts and clips were removed and new bolts and clips were applied to every other tie. On the alternate ties the clips were electrically welded to the ties and no bolts were used. To provide a satisfactory welding job an air-sandblast was used thoroughly to clean the rails and ties at the point at which the welding was done.

The sandblast device consists of a funnel-shaped reservoir for the sand, and a piping arrangement so that the sand is forced by air through the opening at the bottom into a 1-in. pipe. The accompanying sketch shows the construction. Air for this sandblast device was furnished by a compressor and, in one hour, more and better work was done than was possible in eight hours previously with four laborers using chisels and wire brushes. The device is simple and inexpensive but has proved to be very efficient.




**Type of sandblast machine used by San Antonio Public Service Company for sand blasting rails and ties previous to welding**

**Submitted in* Electric Railway Journal *Prize Contest.*

*Electric Railway Journal Maintenance Data Sheet*

ROLLING STOCK—MISCELLANEOUS—51

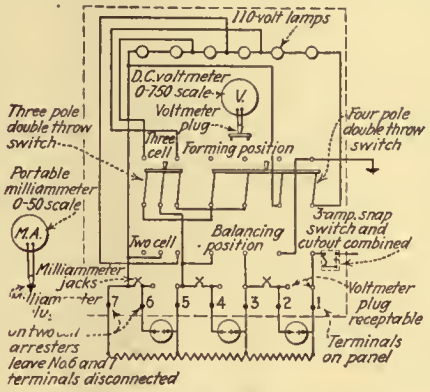
# Equipment for Testing Lightning Arresters*

By H. J. Beadle

*Engineer of Equipment Dallas Railway & Terminal Company*
*Dallas, Tex.*

BELIEVING that protection against lightning is well worth the additional amount necessary to keep cell type arresters in good condition, the Dallas Railway & Terminal Company, Dallas, Tex., has arranged a special test outfit for this work. Aluminum cell lightning arresters of the two and three-cell types are used extensively by the railway on its cars. The chief advantage of the cell arrester over the gap type is the elimination of the time lag in the gap. During the past year, out of 77 four-motor cars equipped with aluminum cell arresters, not a single armature has been lost due to lightning. On the other hand, out of 200 two-motor cars protected with gap type arresters, seven armatures were lost which could be attributed as the direct result of lightning.

A two-cell aluminum arrester costs about $19 and allowing a life of five years which is conservative, the capital cost per year is $3.80. Adding to this the maintenance cost of $1.40 and the interest at 6 per cent, or $1.14, the cost per year is $6.34 not including installation, which would be about the same for any type of arrester.




**Testing circuits as used for lightning arresters**

The outfit for testing and building up the films cost the company about $150. The connections are shown in the accompanying illustration. It is complete for two and three-cell operation and was built in the shops of the railway. Before the arresters are put in actual service the films are built up by throwing the four pole switch in the position marked for forming. In this position the cells are placed in series with the six 110-

*Submitted in Electric Railway Journal Prize Contest.*

OVER

*Electric Railway Journal Maintenance Data Sheet*

ROLLING STOCK—MISCELLANEOUS—52

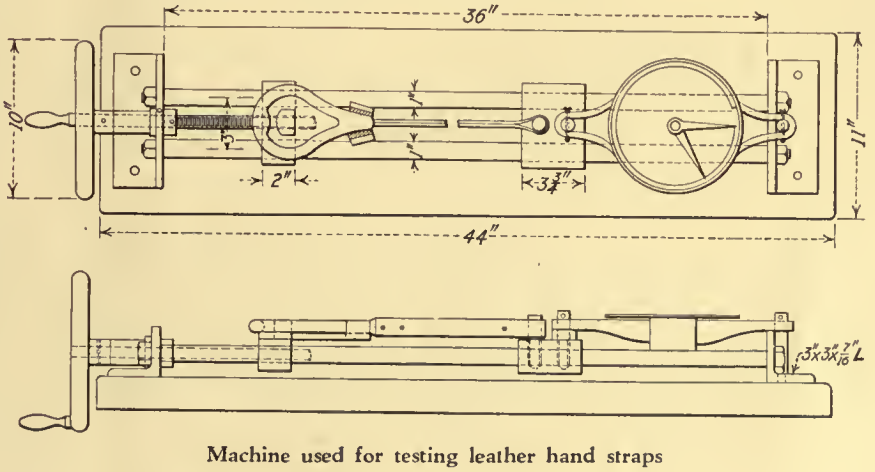
# Hand Strap Leather Testing Machine*

By H. J. Coventry

*Chief Draftsman United Railways & Electric Company*
*Baltimore, Md.*

JUDGMENT of various inspectors has been relied upon by the United Railways & Electric Company, Baltimore, Md., to decide when hand straps should be removed from the cars as unfit for further use. The object of such inspections, of course, was to remove the strap and avoid actual breakage while the cars were in service. With this method it was inevitable that straps were removed for surface cracks although actually much stronger than others showing no cracks. This led to the desire for some method which would give definite knowledge as to the serviceability of a strap. A machine was accordingly constructed for submitting the strap to a tensile test under a measured load.

The machine consists of a frame tapped to receive a $\frac{3}{4}$ in. screw controlled by a handwheel. A spring balance fastened to the other block




**Machine used for testing leather hand straps**

*Submitted in Electric Railway Journal Prize Contest.*

OVER

*Electric Railway Journal Maintenance Data Sheet*

ROLLING STOCK—MISCELLANEOUS—51

## Equipment for Testing Lightning Arresters*—Continued

volt lamps at the top of the panel. Immediately the lamps will burn bright and then become dark, showing that the film on the plate has been built up and no more current is allowed to flow in the circuit. The lamps are used merely to reduce the amount of current flowing during the formation period.

After the film has been formed the four-pole switch is thrown into the balancing position where it remains until everything abnormal has ceased and each cell has approximately the same voltage. Voltage readings are taken by inserting a voltmeter plug in the voltmeter receptacles. After the readings have been taken the voltmeter plug is removed and milliameter jacks are inserted in the places marked in the illustration. This shows the leakage current across each cell. At first the leakage current is rather high but soon comes down to a normal value of about one milliampere. It is found that the leakage current per cell may run as high as two milliamperes and not be objectionable, before the cells under test are finally removed from the test board.

Since this equipment has been used no trouble has been experienced in balancing either the two of the three-cell type of arresters. The leakage current in either the two or the three-cell types is about the same. The test assures that arresters when installed on the cars are in first-class condition, and experience without such a test has taught the value of knowing that everything is right or else hot cells and minor troubles develop in service.

**Submitted in* ELECTRIC RAILWAY JOURNAL *Prize Contest.*

*Electric Railway Journal Maintenance Data Sheet*

ROLLING STOCK—MISCELLANEOUS—52

## Hand Strap Leather Testing Machine*—Continued

shows the load to which the hand strap is subjected.

The strap to be tested is placed on the stud of the spring balance block at one end and the handle of the strap is placed over the lug on the tapped block. To eliminate secondary bending stresses in the handle a wooden block carved to the inner contour of the handle is placed over the lug. This mounting gives a test to the strap and handle as a whole.

When it is desired to test the leather only, a $\frac{5}{16}$ in. steel plate is placed over the lug instead of using the wooden block. The plate has two flanges or ears lined with soft wood against which the top tapered portion of the handle rests. The loop of the handle is free of any other contact with the block.

The machine has not been in use long enough to show the savings effected, but as an index, three used and "rejected" straps were picked at random and tested in both ways described. Nos. 1 and 2, whole straps, did not break when subjected to 250 lb. No. 3, a whole strap, did not break when subjected to 275 lb. The leather of No. 3 was subjected to an additional test of 550 lb. without breaking. This strap had a cracked bakelite handle when removed from service before the test.

Many other uses for the machine have been suggested. By providing suitable clips different materials may be tested, and by providing a scale and an index pointer on each block the extension of the specimen under load may be obtained by taking the difference of the two indices before and during the test.

**Submitted in* ELECTRIC RAILWAY JOURNAL *Prize Contest.*

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*Electric Railway Journal Maintenance Data Sheet*

ROLLING STOCK—TRUCKS—32

# Convenient Equipment for Pumping Grease to Car Gearing*

By Harvey L. Bullock
*General Foreman of Electrical Equipment*
*New York Central Railroad, White Plains, N. Y.*

FOR greasing car gearing, a standard grease pump of the type found in many garages, is used in the White Plains shops of the New York Central Railroad. This is fitted to a special head that will fit over a standard grease drum. The drum with the grease is dropped by a crane into a galvanized iron box, lined with asbestos, which is anchored with expanded metal lath. Electric heaters are provided inside the box, so that the grease can be kept soft. Plugs and receptacles are provided so they can be connected to standard shop circuits. Current is supplied to the electric heaters for one to 1½ hours, and the grease is brought to proper consistency to pump.



**Greasing gears in the White Plains shops of the New York Central Railroad by means of special equipment**

Each revolution of the pump supplies 1 lb. of grease, and the man who does the greasing and carries the end of a metallic line canvas grease hose, tells the operator the number of turns required to give the desired quantity of grease. The end of the hose is provided with a molasses gate valve, so that the grease flow can be shut off with no drippage. The box into which the grease drum fits is mounted upon a ball bearing truck with a handle so that it can be pulled about the shop readily. A top fits around the drum tightly.

**Submitted in* Electric Railway Journal *Prize Contest.*

*Electric Railway Journal Maintenance Data Sheet*

ROLLING STOCK—TRUCKS—34

# Simple Type of Wheel Grinder*

By E. M. Lunda
*Superintendent of Shops & Equipment*
*Grand Rapids Railroad,*
*Grand Rapids, Mich.*

FOR grinding wheels while they are mounted on axles, a simple wheel grinding equipment has been made in the shops of the Grand Rapids Railroad, Grand Rapids, Mich. A framework of I-beams is used for supporting the wheels and grinding equipment. The grinder wheel is mounted directly on the shaft of a 3-hp. motor. It is 14 in. diameter and 2½ in. thick. This is the same as the width of the wheel tread. Wheels are revolved at a speed of 65 r.p.m., and the grinder wheel runs at 1,500 r.p.m. To rotate the wheels, a split pulley is bolted to the center of the axle, and this is belted to a countershaft which runs in the pit below. The motor for grinding the wheel is mounted at an angle of 1 to 25, so as to give the proper slope to the tread. The travel of the motor in and out while grinding is regulated by a large handwheel with a screw, the base of the motor sliding back and forth.



**Wheel grinding equipment used in the shops of the Grand Rapids Railroad**

To keep the grinding wheel true, a hand dresser is used. This is shown at the right corner in the accompanying illustration. When the emery wheel requires dressing, the hand dresser is bolted to the frame and travels across the stone face by pulling the handle of the dresser back and forth. This provides a quick and effective means for truing.

**Submitted in* Electric Railway Journal *Prize Contest.*

*Electric Railway Journal Maintenance Data Sheet*

ROLLING STOCK—TRUCKS—33

# Special Rack for Storage of Axles*

By C. B. Hall
*Chief Clerk Mechanical Department*
*Virginia Electric & Power Company,*
*Norfolk, Va.*

RESERVE axles of the Virginia Electric & Power Company, Norfolk, Va., are stored on a special rack erected by the mechanical department. Eight pieces of old cross ties were utilized, together with two sections of 100-lb. "T" rail, 30 ft. long. The cross ties are placed in the ground and extend 18 in. above it. The "T" rails are spiked to these supports.

Storage space is provided on the rails for 70 axles. A single axle can be removed without disturbing the others, and this feature is of particular advantage over the arrangement previously used where they were placed in a pile. Since the rack is in the open air all axles are painted before being subjected to exposure.



Rack for storage of spare axles

*Submitted in Electric Railway Journal Prize Contest.

*Electric Railway Journal Maintenance Data Sheet*

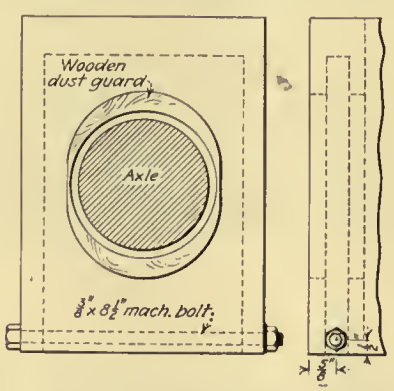
ROLLING STOCK—TRUCKS—35

# Holding Dustguards in Position to Prevent Wear*

By Equipment Department
*Georgia Power Company, Atlanta, Ga.*

TROUBLE has been experienced from wooden dustguards in journal boxes of cars operated by the Georgia Power Company, Atlanta, Ga. The wooden dustguards rest on top of the axle and wear both the axle and the dustguard. This causes an opening at the bottom side of the axle.

To overcome this trouble a $\frac{3}{8}$x8$\frac{1}{2}$-in. machine bolt has been installed in the bottom of journal boxes. Dustguards are slotted, so as to fit over and rest on this bolt. Use of this bolt has also overcome trouble from the dustguard breaking out at the top and letting the guard drop down and extend out at the bottom of the journal box which was an annoying source of trouble.




Back view of journal box showing location of bolt to hold wooden dustguard in position

*Submitted in Electric Railway Journal Prize Contest.

# *Improvements Suggested* for Maintenance Equipment

NUMEROUS suggestions for new tools needed for track and line maintenance were made in the Nov. 17 issue of ELECTRIC RAILWAY JOURNAL, and many more have been received since that time. Some of them are presented here. These suggestions have been made as a result of a campaign for better tools as advocated by the executive committee of the American Electric Railway Engineering Association. The industry has recognized that a higher standard of maintenance is essential, and in order to carry this out economically many improved tools are needed. Experience with present equipment has also shown that much of it is unsatisfactory in certain respects. Prominent men in the industry have recognized this need and are taking this means of calling attention of the manufacturers to needed improvements, in the hope that new equipment will be developed to meet requirements.

ELECTRIC RAILWAY JOURNAL asks that all men who have experienced difficulty in any line of maintenance work send in their suggestions concerning the kind of equipment that would be helpful to them. An outline of improvements that are needed in present equipment and new devices will prove of advantage. By co-operation of the men actually confronted by these problems, the limitations of present shop, track and line maintenance equipment can be brought forcibly to the attention of interested manufacturers. Suggestions will be published in these columns, and maintenance men and manufacturers are invited to enter the discussion. Manufacturers are urged particularly to tell why some of the much-needed tools are not available and to tell how some of these suggestions can be carried out with advantage. Letters are requested from anyone who has suggestions to make regarding needed improvements in existing equipment, or new devices that should be brought out.

## Dry Concrete Material Mixer Needed

*Suggestions by* LOUIS T. BOTTO

*Superintendent Maintenance of Way Department, San Antonio Public Service Company, San Antonio, Tex.*

TWO years ago the San Antonio Portland Cement Company placed at the disposal of cement users in this section a fully equipped laboratory for free testing of concrete and of concrete-making materials. This service has been used much by our maintenance of way department, and we have found great advantages both in economy and in strength in making concrete by keeping the water content down as low as possible.

Our maintenance of way department has two Smith mixers that are used on all new trackwork where it is possible to keep the traffic off it for fifteen days. On our maintenance jobs, however, it is not always possible to keep traffic off the work and it is often necessary to use concrete with a water content much less than one of water to one of cement. In these instances it is necessary to mix and place the concrete by hand, as it is impossible for the ordinary concrete mixer to discharge this dry mix.

On three major repair jobs during this year, this dry hand-mixed concrete was used exclusively and after being tamped in place was topped with asphalt and the street opened to traffic. One great need of our maintenance of way department is for a concrete mixer designed especially to mix and discharge a concrete mix, containing only sufficient water properly to hydrate the cement in the batch.

### A SMALL PAVING MIXER NEEDED FOR RAILWAY WORK

One of the greatest needs of our maintenance of way department is for an inexpensive mixer about the size of an ordinary two-sack concrete mixer, in which hot road oil of about 12 gravity, rock screenings and finely-ground asphalt or other combinations of asphalt and stone may be mixed thoroughly and from which the material can be discharged readily. For the past three years we have been mixing by hand in different combinations these materials for use in our regular paving maintenance work, and have effected a considerable saving over maintenance methods previously used to do this.

Our company has 250,000 sq.yd. of paving to look after and keep in good condition. As this paving becomes older it requires more and more attention. We do not feel that the amount of work which we have to do justifies our department in asking for an expensive paving plant, but we do believe that a suitable, inexpensive paving mixer would be very desirable and that it would pay for itself in a short time.

### COME-ALONG CLAMP NEEDED FOR JOINT WELDING

Three years ago the San Antonio Public Service Company began a six-year program of seam welding and reinforcing rail joints of 60-lb. A.S.C.E. rail in gravel ballast track. The aim was to recondition from 4 to 6 miles of the 30 miles of this type of track each year until the entire work was completed. The type of joint used in this work was shown in the issue of ELECTRIC RAILWAY JOURNAL for Aug. 20, 1927. This work has gone forward as planned, and we have at this time 13.9 miles yet to be done.

In connection with the welding of these joints a new device is needed. This should provide for gripping the base or web of the rails on each side of the joint, and for pulling them together tightly while the welding is in progress.

**Mr. Manufacturer**

Have you any equipment that can be adopted to the needs outlined on these pages?

SEND IN YOUR COMMENTS

The use of such a device will also permit cars to pass over the track while the welding is being done. Such a device should be of light weight, strong and arranged so that it can be applied and removed easily and quickly, and by one man. We have designed and tried out several different kinds of come-along clamps, but none has proved entirely satisfactory.

With this class of construction work tracks are opened up and new ties are put in where needed. New ties are placed on 10-ft. centers, and the tracks aligned and resurfaced. Where rails are worn badly they are renewed. While this work is in progress the welders follow the track gang and weld the joints. The great advantage of having a satisfactory come-along clamp is to have the welding crew do all of the welding work, without the necessity of calling upon the track gang to come back and make the joints tight for the welders. A suitable device of this kind would speed up the work and insure better joints.

## Equipment Department Lacks Improved Fixtures

*Suggestions by* H. S. Williams
*Assistant Superintendent of Equipment Department of Street Railways, City of Detroit, Mich.*

IN THE equipment department of electric railways workmen are under a great handicap due to lack of devices for holding and clamping parts in position during machining operations. There appears to be particular need for a line of air clamping devices which will hold work in drill press operations. Inasmuch as the maintenance shop has such a large proportion of drilling operations to perform, and these must be carried out on odd-shaped pieces in small quantities, there is no possibility of speeding up production by the use of jigs and fixtures. Quick operating devices and clamps are needed badly.

### Universal Line Reaming Machine Should Be Developed

It has been established that greater life may be obtained from armature and axle bearings of railway motors if adequate bearing preparation is used. This work necessitates a reduction of clearances to the minimum in the original fitting, and this in turn means true shaft bearings and liners which are machined in true alignment. It is believed that a universal line reaming machine can be developed which will function to line-ream the bearings of motors and so give them proper fitting.

### Many Improvements Needed That Will Reduce Car Noise

As to car equipment, the needs in this line are multitudinous. A few items can be suggested of outstanding importance. In connection with assistance needed in the campaign for noise reduction, the noise reduction committee of the American Electric Railway Engineering Association last year suggested that gear cases be covered with a sound-proofing material. Tests conducted showed that by doing so a great percentage of the total car noise could be eliminated. The commercialization of this feature should be pushed forward.

There is also a need for sound insulating material to absorb sounds reflected from the pavement into the car. Manufacture of such material will be of advantage.

Gear cases which will retain the oil lubrication better than present types are urgently needed. Railway gears as manufactured are notoriously incorrect, and much improvement is needed along lines outlined by the noise reduction committee.

> New equipment must be developed to provide and to maintain the improved service and comforts that the people demand.
>
> Frank H. Miller
> *President American Electric Railway Engineering Association*

## More Permanent Overhead Needed

*Suggestions by* Angus G. Scott
*Assistant Superintendent of Overhead, Cleveland Railway*

AT THE present time the electric railway industry does not possess a stable overhead construction but one which requires frequent tearing down and rebuilding. An ideal type would be one which would, in a sense, be permanent. Suggestions on methods, tools and devices tending to establish permanent overhead construction would be of much value.

The use of non-ferrous wire and materials is a step in this direction. However, many parts of the overhead system which are now subject to wear, such as cars and splicers, crossing facilities, etc., can be developed further into units easily replaced which would cut maintenance costs considerably.

In the overhead department there is a broad field for the further development of present maintenance devices and for the invention of new tools, new equipment and methods. Hand labor, which plays a very prominent part in every overhead plant, can be cut down through the use and development of mechanical devices, such as span wire clamps, which eliminate the necessity of serving wire by hand. The assembling of the plant, which is now largely done in the field, could be done in the shop through new methods and tools.

At present, much overhead material by no means worn out is scrapped. Through the designing and use of the proper apparatus, this material could be reclaimed at a small cost. Such items as ears and splicers are in this class.

> **Maintenance Men:**
>
> Tell us the particular problems that you meet where new equipment or improvements on present devices will be of advantage.

## Clamping Trolley Ears Around Trolley Wire

*Suggestion by* James F. Neild
*Electrical Engineer Toronto Transportation Commission*

ONE of the specific needs of overhead departments of electric railways today is for a device for clamping trolley ears around the trolley wire. This can be accomplished either by pressing or rolling, so as to obtain a smooth underrun and eliminate the ridging caused by peening the ear onto the wire with a hammer. No matter how carefully an ear is peened on, ridges are left and these tend to set up vibration. The elimination of these will be a direct contribution to the industry.

## Universal Boring Machine for Bearings

*Suggestion by* J. T. Porter
*Superintendent of Equipment Virginia Electric & Power Company, Richmond, Va.*

THE Richmond shops of the Virginia Electric & Power Company are in need of a universal boring machine for boring out armature and axle bearings. The machine now in use has been in service around 35 years. While it takes care of the work after a fashion, it has become worn and cannot be depended upon to do accurate work. Repair parts for this machine are not available, and we cannot find a manufacturer who makes a boring machine which will do the work that this particular machine was designed to do.

There is an urgent need for such a machine on many electric railway properties. I have talked to several manufacturers and representatives about this condition, but as yet no one has come forward with a machine that will meet the need. It would certainly be a god-send to the industry if some manufacturer would produce a suitable bearing boring machine.

# SHORT CUTS

## for the Electrical Repair Room

### Peculiar Effect of Miscounting Armature Lead-Spread

IN A four-pole, series-connected, armature with 15 bars and 15 coils, it is possible to divide the commutator bars and coils into three sections insulated from each other, by miscounting the lead-spread. The proper bar to which the number 1 bar should be

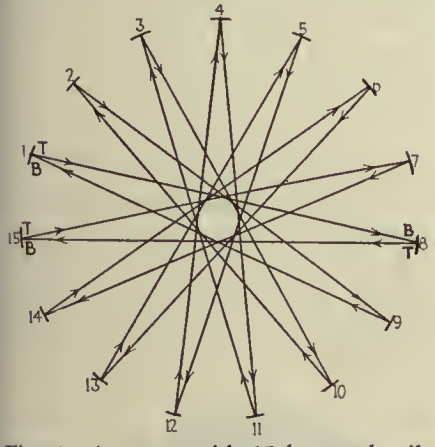



Fig. 1—Armature with 15 bars and coils, correctly connected

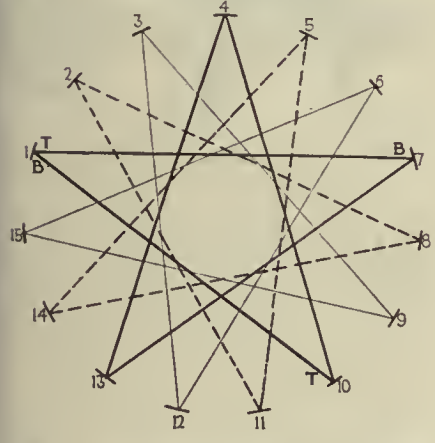



Fig. 2—Counting "one short" divides the commutator bars and coils into three sections, insulated from each other

connected is determined by a definite rule. Should the lead-spread be counted short, the three insulated sections will result.

In Fig. 1 is shown a 15 bar and 15 coil armature, correctly connected. As may be seen, each coil is connected to the one adjacent to it, through two coils in series, the bar joining these two being diametrically opposite the two adjacent bars. With the bars connected in this manner all around the armature, two parallel paths result. The correct spread of the leads of any coil is obtained by dividing the total number of bars by 2 and adding one-half or $1\frac{1}{2}$, depending on the direction of rotation of the armature.

With a 15-bar armature the lead-spread would be either 8 or 9. Fig. 2 shows an armature with its first bottom lead connected to bar 7, instead of to bar 8 or 9, with the result that the bars and coils are divided into three sections insulated from each other. This mistake is called "counting one short." "Counting one over," will produce the same result.

### Position of Winding Machine or Operator Affects Field Coil Polarity

FIELD coils that give reverse polarity when connected in the usual manner are said to be wound left-handed. Strictly interpreted, however, this expression is not true for it is not practicable to wind a field coil left-handed. The winding spindle would have to be turned toward the winder instead of from him, and the wire from the stock reel would have to pass under the winding form instead of over it. Also, the winder would be unable to guide the wire and wedge the turns into place unless he assumed an uncomfortable position.

It is not uncommon for winders of field coils to become confused with the method of winding when a new machine is substituted for an old one. To cite an example of this, a field coil winder had become accustomed to sit with an old machine to his right when winding coils. The operator became much confused in using a new machine, the construction and installation of which required that the winder sit at its right. The direction of rotation was the same for both machines, but this added to the delusion. All winding forms have either a hole or a slot through the flange on one side for securing the starting end of the winding. This, too, causes the winder to become confused, because he is almost certain to use the hole or slot already in the form.

To illustrate the difference, the winding *A* in Fig. 1 has been started on the right-hand side of the form, while the winding *B* has been started on the left-hand side. Viewing the starting side of the form as indicated in the diagram and conceiving current to enter the coil by way of the starting end, it will be seen that the current flow in the coil of *A* will be clockwise while that in the coil of *B* will be counter-clockwise.

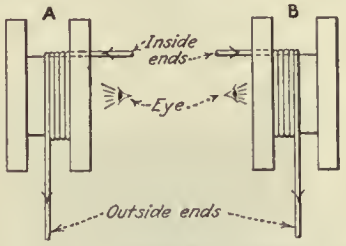



Fig. 1—Two positions of winding forms

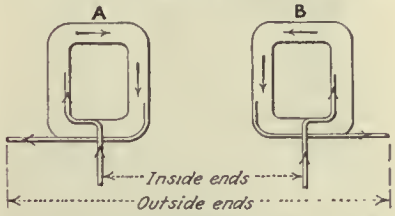



Fig. 2—Two coils removed from the winding forms showing the slight difference in appearance though wound from opposite ends

The appearance of the coils when removed from the form will be the same to the casual observer. The similarity of appearance is emphasized in Fig. 2, which shows the two coils when removed from the form. Unless trouble has been suspected, the error will not be detected and the coils will be insulated in the usual manner. When insulated, they will appear exactly the same, but this does not correct the effect of the reversed winding, namely, reversed polarity. To avoid this trouble when a machine that requires the operator to sit on the opposite side is installed, it is necessary to cut slots or holes in the opposite flanges of all winding forms.

# *New Offerings of* Useful Equipment

## Safety Panelboards for Electric Cars

DURING the last year the Westinghouse Electric & Manufacturing Company has developed a new line of panelboards for controlling the lighting systems of electric and steam railroad cars. Full safety type panelboards place the entire control under the supervision of the operator, since they are so compact they can be mounted within easy access.



Panelboard for city or interurban cars

These panelboards were designed not only to provide safety for subway, elevated and steam railroad cars, but also to give the railways a lighting and power control panelboard that is flexible enough to meet all conditions. All mechanisms form individual units so that any one unit can be removed without disturbing the others. The compartments are arranged so that, where necessary, barriers are provided between all live parts.

The trims are made with two doors, one over the fuses and one over the switches. Each door requires a separate key which permits only authorized persons to gain access to the compartments. Trims are furnished in any color to match the interior finish of car.

## Across-the-Line Reversing Switch

DEVELOPMENT of a new motor control switch suitable for reversing small alternating-current motors in cases where the motor can be thrown across the line is announced by the General Electric Company, Schenectady, N. Y. It consists of two triple-pole, barrier-type, magnetically-operated contactors, mechanically and electrically interlocked, and two hand-reset temperature overload relays mounted on a molded base and enclosed in a drawn-shell enclosing case.

Double-break contactors with silver contacts, operated by a high-speed solenoid, give the switch a very high interrupting capacity with minimum arcing. The new type silver contacts eliminate the need for the shunt straps and, since silver oxide is a conductor, minimize contact resistance.

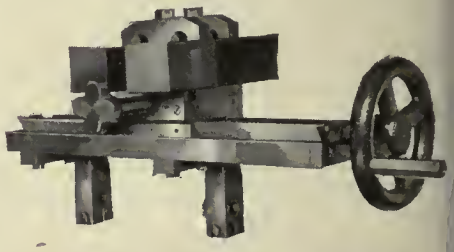
Two temperature overload relays protect the motor from overheating because of mechanical overload or single-phase operation. These relays are a fixed part of the switch, but have interchangeable heaters. To adapt this switch for use with a motor of a different rating but the same voltage, it is merely necessary to select heaters corresponding to the motor current.

The enclosing case, finished in black water Japan varnish, has rounded edges and corners which give it a neat appearance. The cover is held in place by two pins at the top, and by a screw at the bottom. Additional clips can be supplied to permit the use of a padlock.

Many applications, such as motor-operated doors and windows, valves and machine tools, require a reversing switch, a push-button and either a geared-type or track-type limit switch. The size and appearance of the new switch are such that it can be mounted readily on any machine for use with any of these applications.

## Tool Rest Improves Commutator Grinding

TO INSURE a more nearly perfect job when using Ideal commutator resurfacers, the Ideal Commutator Dresser Company, Sycamore, Ill., has just placed on the market a new tool rest. This attaches to the brush arm and results in a great saving of time in commutator grinding, as it eliminates the necessity of dismantling motors and generators in order to resurface the commutators.



New tool rest for use in resurfacing commutators

Bases for the tool rests are available in lengths from 6 to 28 in., varying by 2 in. Those 14 in. or smaller have two supports while the 16 in. or longer bases have three supports. The supports are L-shaped, either 2 in. or 3 in. high, or T-shaped 3 in. high for attaching to round brush arms. Flat supports can be substituted when necessary to attach to flat brush arms. Each base has a large diameter wheel to facilitate easy operation of the cross feed, also a screw-infeed adjustment.

# News of the Industry

## Ten Cents in Rochester

Cash fare on the Rochester lines of the New York State Railways will be increased to 10 cents on Jan. 1, according to an announcement of James F. Hamilton, president of the company. The present fare is 9 cents. Car tickets will be sold at the present rate of twelve for $1. Thus only the casual rider who does not purchase tickets will be affected by the raise.

Under the terms of the service-at-cost contract with the city, the railway is allowed a 6 per cent return on its investment. The surplus goes into a balancing account fund. The contract stipulates that when the balancing account reaches $500,000, the fare is to be automatically reduced and when it goes below $200,000, the fare is raised. The balancing account, $300,000, was created in 1920 when the service-at-cost contract went into effect. The balancing account now shows a deficit of $80,000. The contract expired in August, 1930. If the increase in fare brings the balancing account up to $500,000 before Aug. 1, 1930, the fare will be automatically returned to 9 cents, Mr. Hamilton pointed out.

The fare was raised from 8 to 9 cents last December and from 7 to 8 cents in January, 1926.

Cash fare is 10 cents on the other properties of the New York State Railways in Syracuse and Utica.

## Five-Cent Shuttle Discontinued in Seattle

Seattle's shuttle system, that in the vernacular "ran rings" around the business district from Yesler Way to Olive Way for the benefit of short-haul shoppers, has been discontinued by the Municipal Railway, whose sponsors said it was a losing business. The fare was 5 cents with no transfers, but the route was confined to a comparatively small district. One-man cars were used. The service, started on Nov. 7, 1927, was described and illustrated in an article in the JOURNAL for Feb. 11, 1928, page 253.

## Rapid Transit Survey to Start Soon in St. Louis

Rudolph E. Kelker, Jr., Chicago, who has been retained as engineer for the Rapid Transit Survey Commission of St. Louis, Mo., visited St. Louis on Nov. 30 to confer with city officials and members of the commission. He will begin active preliminary work at once, after which he will outline for the commission his complete program of procedure. Actual field work will not be undertaken for several months. He said the city should first find out what it wants to spend money for and then spend it wisely. He stressed the necessity for a reasonable fare and the assurance of continued use of rapid transit facilities after they are constructed. He pointed to the St. Louis Public Service Company as a "probable tenant." Mr. Kelker said that subways should be built only where it is absolutely imperative. His opinion is that elevated lines can be made both sightly and comparatively noiseless.

## Automobile Men See Parking Need

### New York merchants suggest reasonable parking restrictions with policing regulations based on experience in Central West, particularly Chicago

MAYOR WALKER of New York has before him a report of the traffic committee of the Automobile Merchants Association of New York, making fourteen concrete suggestions for the improvement of traffic in New York City as follows:

1. Secure the necessary amendments to the building code and zoning laws to permit the erection of parking garages.
2. Follow the example of the city authorities of Chicago by providing ample parking space before drastic non-parking regulations be adopted.
3. Compel all sight-seeing buses to vacate streets immediately and occupy terminals.
4. Skip-stops for all surface cars and city-type buses.
5. Require all buildings above a certain height or tenant capacity either to provide garage facilities in lower floors or core of building.
6. Progressive control light system of traffic signals throughout the city.
7. Traffic light suspended in center at street intersections.
8. Install stop-street signs wherever required.
9. Permit driving through the safety zones.
10. Compel all slow-moving vehicles to keep well to the right.
11. Issue summons to pedestrians disregarding traffic signals and make it unlawful for any pedestrian to cross a roadway other than with released traffic, wherever traffic is directed by a police officer.
12. Hasten completion of express highway and provide parking facilities thereunder.
13. Hasten alterations on Queensboro Bridge in order that the movement of traffic at that point be expedited, and rush condemnation proceedings with respect to property required at western end so that the bridge has adequate approaches.
14. We believe the Police Department is doing splended work. We recommend that our traffic courts be reorganized, using as models the Traffic Violations Bureau of Detroit, the Chicago Traffic Bureau and the Los Angeles Traffic Violations Bureau.

In its letter to Mayor Walker, the committee suggested that its report be turned over to the engineering firm of Day & Zimmermann, which has been suggested to the Board of Estimate for retention to make a traffic survey of New York City. The committee believes that "the citizens of New York are looking for some kind of traffic relief as soon as it is humanly possible to accomplish it." The committee says:

We were fortunate in meeting Dr. Miller McClintock, who was employed by the Chicago Association of Commerce to make the original traffic survey and upon whose recommendations the ordinance is predicated. Dr. McClintock stated that he was quite familiar with the New York traffic situation, but did not desire to make a survey thereof unless he were assured that the city authorities were ready and willing to proceed with a definite plan of traffic relief immediately after such survey had been completed. We believe that steps should be taken to obtain the services of Dr. McClintock in order that a satisfactory solution of our local traffic problem be achieved.

The rapid movement of traffic on main highways in Chicago was of especial interest, particularly along such main thoroughfares as Michigan Boulevard, Lake Shore Drive, Lief Ericksen Boulevard, made possible by virtue of the following:

1. Thirty-five miles per hour on boulevards and main thoroughfares.
2. Twenty-five miles per hour through the Loop district.
3. Stop streets at intersections at main thoroughfares indicated by large stop signs.
4. Right hand turns permitted.
5. Left hand turns permitted against a red light at every other block under police direction.
6. Progressive system of traffic control on intermediate traffic lanes.

In Chicago the number of arrests for traffic violations is low, even though the fines are nominal. For example, they range for minor infractions from $1, $2 and $5 for the first, second and third

## 20,000 New York Taxis Have $160,000,000 Income

A. Freed, president of the Paramount Cab Manufacturing Corporation, estimates that 20,000 cabs of New York's taxi fleet have a yearly income of $160,000,000. Mr. Freed pointed out that for every $1 spent on subway, elevated lines and trolley lines for fare, $1.02 is spent for taxi transportation.

offenses respectively. General observations and conversations with police officers indicated to us that the Police Department was experiencing very little difficulty in connection with enforcement of the ordinance. Parking is permitted in the Loop after 6:30 p.m.

In conclusion, the committee believes that non-parking effective from 7:30 a.m. until 6:30 p.m. in the Loop, is a decided benefit to the city of Chicago.

## Traffic Problems Discussed

Comprehensive reports on many phases of the traffic problem as it exists today were presented and discussed at the tenth annual meeting of the National Highway Traffic Association held Dec. 10-12 at the Automobile Club of America, New York City. Of particular interest to electric railway men was the report of the committee on traffic control on car tracks and adjacent to safety zones, of which E. J. McIlraith was chairman. The recommendation was made that the construction of the safety zones should provide a slightly raised area 4 ft. wide and extending a few feet more than the length of the longest car to be used in the zones, or the length required for two cars if a double-loading berth is to be used. The nearest side of the zone should be 30 to 32 in. from the gage line of the rail. The zone ends should be protected by a bumper of a type which will stop an automobile or deflect it sidewise without causing as much damage to the vehicle as would be the case if it were stopped by very heavy pipes set vertically in the pavement. The zone end should be thoroughly illuminated by floodlighting, and by two yellow flashing lights set about the height of the tail light of an automobile and pointed toward on-coming traffic. It was further recommended that alongside the curb, opposite safety zones and for a distance of at least 25 ft. beyond the end of the safety zone, parking should be prohibited.

The only object to be accomplished by prohibiting driving to the left of the safety zone, the committee pointed out, would be to avoid unnecessary interference to street cars.

Elimination of automobile parking was discussed in a report of the committee on parking regulations, of which Prof. Roger L. Morrison was chairman, and also in a talk on problems of efficient street use by vehicles and pedestrians, by Dr. Miller McClintock.

Pedestrian control was the subject of a report of a committee of which Prof. Lewis M. McIntyre is chairman. It was the consensus of opinion that pedestrian control is desirable, but it was generally admitted that enforcement is extremely difficult.

Reports were presented also on numerous subjects dealing with general phases of highway traffic, including economics, safety, insurance and terminology. A considerable number of electric railway men were present at the meeting and participated in the discussion about mass transportation.

## No More Jitneys

**Detroit Council passes measure that would rule them out forever. Corporation Counsel approves move**

IN ANSWER to the proposal that the jitneys which were ousted from the main thoroughfares of Detroit, Mich., by the recent Supreme Court decision, be rented to the city at $1 a day each, the City Council passed an ordinance to prohibit the operation of so-called jitneys, on the streets, avenues, boulevards and public places of Detroit. This measure provides against the operation of jitneys on any city street or any thoroughfare mentioned in the original ordinance, the validity of which was finally established after six years of court action involving the jitneys and the city.

A letter from the corporation counsel, Clarence E. Wilcox, presented to the Council, cited that since the decision of the Michigan Supreme Court in the jitney litigation, 45 separate petitions were filed with the Mayor seeking permission to operate jitneys on some of the streets covered under the old ordinance. The number of individual applications involved was close to 11,000. For the most part these jitneys would all converge in the center of the city and contemplated the use of loading stations in the congested areas.

This, of course, would create a condition similar to the one found objectionable before, he pointed out. The requested routes were for the most part on streets already served by street cars or buses. He further expressed the opinion that the city should take a definite stand on these applications, and not leave to litigation the matter of how many privately-owned jitneys should operate or the streets they should use. He said the question was "whether or not further operation of jitneys is desired in the City of Detroit." He said:

> The granting of licenses or permits to a large number of independent organizations or individuals would render adequate protection to the traveling public impossible. No form of insurance protecting property or personal damage would be possible or practicable. No regulated or prescribed schedule could be enforced. Privileged tax based on mileage would be almost impossible to ascertain.

The new ordinance was presented to the Council simultaneously with Mr. Wilcox's letter, and passed its first and second readings at once. It was finally passed at the next regular meeting.

## Aviation Discussed at New York Railroad Club Meeting

More than 3,000 persons attended the annual dinner of the New York Railroad Club at the Hotel Commodore, New York, on Dec. 13. It was "A Merrie Christmas" as the program and seating list said. It was particularly merry for W. G. Gove, superintendent of shops of the Brooklyn & Manhattan Transit Corporation, who was presented a watch, and for J. S. Doyle, assistant general manager of the Interborough Rapid Transit Company, who received an autographed album as a testimonial for his work in behalf of the club. But enthusiasm for this part of the program must not be permitted to becloud the fact that the addresses were all concerned with transportation of the future. President Eliot Sumner presided. George Le Boutillier, vice-president of the Pennsylvania Railroad, was the toastmaster. Between Mr. Le Boutillier and Count Ernesto Russo, who discussed "America As I Find It," the diners were certainly kept amused. When a foreigner finds America it usually is funny. Even the Indians thought so in Columbus' time. Count Russo brandished no tomahawk, but he did some verbal scalping. He preserved his disguise until the last. The hilarity of the evening was tempered with the addresses: "What the Air-Rail Business Means," by C. M. Keys, president of the Transcontinental Air Transports, Inc.; "America's Transportation of the Future," by Elisha Lee, vice-president of the Pennsylvania Railroad; "Comments on the Airship Situation," by Commander Charles E. Rosendahl, U. S. S. Dirigible Los Angeles, also naval observer on the Graf Zeppelin; "The Co-ordination of Air and Rail Transportation," by Charles M. Paulding, vice-president in charge of public relations of the New York Central Lines.

## Useful Pamphlet Issued in Erie

A transportation folder of the City of Erie, Pa., is being distributed this month by the Erie Railways and Erie Coach Company. It contains schedules of street cars and coaches and other information regarding the city's transportation facilities.

## New Parking Ordinance in Chicago

Automobile parking on North Michigan Avenue, between Randolph and Oak Streets, Chicago, except for 30 minute periods between 11 a.m. and 4 p.m. is prohibited under a new city ordinance which became effective on Dec. 7. No-parking restrictions have been in effect on Michigan Avenue south of Randolph Street and on streets in the "loop" district for nearly a year.

The new regulation makes possible eight full lines of moving traffic, thereby increasing by approximately 40 per cent the capacity of this important north and south boulevard. A two-day test of the new order showed a remarkable acceleration of traffic to and from the "loop" district at the southern end of the restricted zone, according to the police department. Movement of traffic on this thoroughfare had been further expedited by the recent installation of a progressive signal light system.

Witnessing the immediate relief from congestion the West Chicago Park commissioners passed an ordinance prohibiting parking on the principal west side thoroughfares, and on Oakley and Sacramento Boulevards.

## Is the Subsidy Coming?

There is no secret as to what is happening to street railways. Increasing use of automobiles has cut seriously into their revenues, while congestion of the streets, which is becoming worse and worse, presents immense obstacles to efficient and economical operation. The matter is becoming one of profound importance to the general public, involving the growth and progress and well-being of our cities. Students of the subject, not themselves interested in the business, are predicting the possibility that municipalities will be compelled to contribute to the support of street railways. The suggestion of such a policy emphasizes the gravity of the problem.—*Baltimore Sun.*

## Higher Rates Effective in Illinois

The Illinois Commerce Commission on Nov. 27 vacated previous orders of suspension and announced that car and bus rates in several cities served by the Illinois Power & Light Company will be increased at once to 10 cents with three rides for a quarter, from 7 cents with four rides for a quarter. The commission had suspended the increases until May 24, but that delay is now set aside. The cities affected are: Jacksonville, Danville, Galesburg, Quincy, Bloomington, Normal and Decatur.

Mayor O. W. Smith of Decatur, Ill., has suggested that the city enter the bus transit business in order to bring about lower fares on the lines of the Illinois Power & Light Company. Mayor Smith would charge only 6 cents on the city-owned buses.

## Just for Maine's School Children

The Biddeford & Saco Street Railway began operations on Dec. 7 between City Square, Biddeford, Me., and Granite District, a suburb of Biddeford. This line was abandoned several months ago after repeated attempts to put the line on a paying basis. Service is being reestablished solely for the benefit of school children and comes after an arrangement between the Biddeford Board of Education and officials of the railway. Permission was secured from the Maine Public Utilities Commission. One trip will take the children to school at 8:10 a.m. and another will bring them home at 4:05 p.m. The line is believed to be the only one in the country operated solely for school children.

## T. H. Tutwiler Honored

T. H. Tutwiler, president of the Memphis Street Railway and the Memphis Power & Light Company, Memphis, Tenn., was recommended as a member of the board of directors and the executive committee of the Southwestern University. Mr. Tutwiler has consented to serve.

## COMING MEETINGS OF *Electric Railway and Allied Associations*

*Jan. 4, 1929*—Metropolitan Section, American Electric Railway Association, 33 W. 39th St., New York, N.Y.

*Jan. 14-18*—American Road Builders' Association, convention and road show, Cleveland, Ohio.

*Jan. 15-16*—Kentucky Association of Public Utilities, annual meeting, Brown Hotel, Louisville, Ky.

*Jan. 22*—New York Electric Railway Association, mid-winter meeting and dinner, Hotel Commodore, New York, N. Y.

*Jan. 23-25*—Electric Railway Association of Equipment Men, Southern Properties, and Southwestern Public Service Association, Mechanical Division, joint meeting, Houston, Tex.

*Jan. 24-25*—Central Electric Railway Association, Claypool Hotel, Indianapolis, Ind.

*Jan. 25-26*—Central Electric Railway Accountants' Association, Claypool Hotel, Indianapolis, Ind.

*Jan. 28-Feb. 1*—American Institute of Electrical Engineers, annual convention, 33 W. 39th St., New York, N. Y.

*Feb. 7-8*—Midwest Electric Railway Association, Midwinter meeting, Robideaux Hotel, St. Joseph, Mo.

*Feb. 14*—Central Electric Railway Master Mechanics' Association, Youngstown, Ohio.

*Sept. 28-Oct. 4*—American Electric Railway Association, 48th annual convention and exhibit, New Public Auditorium, Atlantic City, N. J.

## Ready to Serve as Mediators in Chicago

The committee of five citizens appointed by Federal Judge James H. Wilkerson, as a traction settlement committee to co-operate with city officials and railway companies in agreeing upon a new franchise for Chicago, is awaiting endorsement of the movement by the City Council. The Council has refused to suspend the rules to consider approval of the commission.

Judge Wilkerson, in whose court is pending the receivership of the Chicago Railways, representing 60 per cent of the Chicago Surface Lines, appointed the commission in the hope that it could determine on a plan for settlement and legislation necessary to obtain from the General Assembly, and get the approval of the city and companies.

Federal Judge James H. Wilkerson is expected to rule within the next few days on the request of the receivers of the Chicago Railways for permission to purchase 60 new cars. If permission of the court is obtained by the receivers for these cars, it is thought likely that the Chicago City Railway, the remainder of the Surface Lines property, will also agree to purchase 40 cars, making a total of 100 for the system. The management wants to purchase cars with front entrance and central exit seating 61 passengers.

Beside Mr. Simpson, who is chairman, the other members of the citizen's committee are: Col. A. A. Sprague, former commissioner of public works; Joseph R. Noel, a Chicago banker, John A Carroll, local real estate operator, and Charles M. Thompson, dean of the College of Commerce of the University of Illinois.

In announcing the new committee, Judge Wilkerson explained that it would not supplant the City Council's transit committee nor would it attempt to speak for the companies. Instead, the committee will probably start considering the ordinance drafted last summer by the Aldermen and upon which negotiations are now being based. It will undertake to smooth out the differences which have frequently created deadlocks in the dealings between the Aldermen and the companies' representatives, by suggesting compromise that would be fair both to the city and the security holders.

Terms of the new ordinance upon which the city and companies are not yet in agreement are the rate of return and powers of the proposed local transit commission. Another important issue which is now under discussion at the joint meetings of the transportation subcommittee and company representatives is that of surface lines extensions. The present draft of the proposed franchise carries a provision which would retain to the city the power to compel the building of extensions. The Aldermen insist that a fund of $135,000,000 should be set aside definitely to take care of extensions during the first ten years of operation under the new franchise. The companies contend that a provision of this kind is unnecessary, in view of the fact that a local transit commission would have mandatory control over the new company's operations and service.

Assistant Corporation Counsel Frederick Bangs recently said to the Aldermen that no legal referendum could be held until the next general election in November, 1929. Because of the opinion it is expected that legislation conferring this authority will be asked in the enabling bills to be presented to the General Assembly next month.

## Skip Stop on Albany Line

The United Traction Company, Albany, N. Y., put into effect on Dec. 1, the alternate skip-stop system on its Broadway line. If successful on this route, it is anticipated the system will be extended by the company to other divisions.

## More One-Man Cars Authorized for Key System

Under authorization of a decision issued Nov. 30 by the California State Railroad Commission, the Key System Transit Company, Oakland, will start extension of one-man street car operation on lines throughout the east bay cities of Alameda and Contra Costa counties as quickly as is "found feasible."

The order is in direct opposition to recent action taken by the Oakland City Council. It was issued in response to an application for the installation of one-man operation made by the Key System recently. The commission's decision reads in part as follows:

It is hereby ordered that applicant be authorized and directed to operate one-man cars on all its traction division lines in the Counties of Alameda and Contra Costa, State of California, except local street cars operated upon and along each of the three following lines, which are primarily devoted to transbay service:

Piedmont Avenue line from 40th and San Pablo Avenue to 41st and Piedmont Avenue.

Berkeley line from 40th and San Pablo Avenue to Ward and Shattuck Avenue.

Sacramento Street line from 40th and San Pablo Avenue to Northbrae, subject to the following conditions:

Said one-man operation shall be installed on the respective lines of applicant as and when applicant shall be financially able to install such operation.

The commission found it to be the fact that street cars with one man can be safely operated on all of the traction division lines of the applicant; that such operation would be adequate and would fully meet the convenience and necessity of the traveling public in all of the communities served, and would result in more economical service and operation than is now being performed.

President Lundberg declared that the company had done its utmost to carry out the pledge made at the time of the 7-cent fare decision, and to meet the recommendations of the commission along the lines of introducing "every possible economy in its operation."

## Explanation of Electrification Situation by Long Island

In a letter recently sent to the Glen Cove Chamber of Commerce on the matter of the electrification of the Oyster Bay Branch of the Long Island Railroad, George Le Boutillier, vice-president, states that the subject has been studied with the idea of deciding whether or not operating economies could be effected. Studies showed a discouraging prospect—an expenditure of $2,150,000 for electrical construction and $1,130,000 for equipment. This total would produce an operation saving of only 3.9 per cent, or 1.1 per cent less than the interest charges on the new capital required. It would seem unwise, he maintained, to entertain the hope that immediate growth of the territory in response to electrification would materially increase the gross earnings of the branch.

In conclusion, Mr. Le Boutillier said:

As you are undoubtedly aware, this company endeavored for several years before the regulatory bodies, without success, to secure an increase in commutation rates in order to have sufficient surplus to make just such improvements as you are requesting. In the absence of this much needed revenue, we are forced to make our expenditures along the lines before mentioned, and regret that we cannot at this time consider those improvements which might be expected to improve our service.

# New Deal Proposed in Canton

### Tentative contract covers operation for ten years. Ten-cent cash fare with five tokens for 35 cents suggested against present 6-cent cash fare with six tokens for 35 cents

THE Transportation Commission which has been making a study of the transportation needs in Canton, Ohio, for the last six months, with a view to preparing a franchise to be submitted to the City Council, has completed its work and drawn a tentative contract covering future transportation in Canton for a period of ten years. For convenience, and to localize the operation, it is proposed to set up a new company to be known as the Canton Railway & Transportation Company, a wholly-owned subsidiary of the Northern Ohio Power & Light Company. To this company a contract will be awarded for all mass transportation in Canton. The tentative ordinance provides:

1. A 10-cent cash fare, five tokens 35 cents, school tickets 5 cents. Free transfers.
2. A ten-year contract with arbitration periods for readjustment.
3. A transportation commission of five men with an advisory commissioner.
4. Arbitration for all disputed points.
5. Commission control of service.
6. Complete operation of all bus and rail service.
7. Modern type of cars and buses.
8. Right to operate freight, express and interurban cars.
9. Establishment of a shelter house in Public Square.
10. Company to keep paving between tracks in good condition. Paving made necessary by new construction to be done as determined by commission.
11. Provision made for purchase of property by the city.
12. Provision made for purchase by operating company of independent bus lines.
13. Penalty clause for failure to obey commission orders.
14. Name of company to be known as Canton Railway & Transportation Company.

Conferences among the commission, City Council and Mayor have begun looking toward possible revision and adoption of the proposed franchise.

One of the principal features of the proposed new franchise is the setting up of a transportation commission consisting of five members who shall be selected jointly, for the term of the ordinance, by the City Council and the company. Members of the commission shall be residential electors of the city. No member of the commission shall be an officer or employee of the city, nor shall have been within the last three years preceding his selection to the commission, and no employee, shareholder or director of the company within the same period be eligible to membership. This is to keep the commission free of all political and other influence.

The commission is empowered to regulate transportation service, including the right and power to require the company to provide additional facilities and service on existing railway and bus lines, and to establish additional bus service in territory not already served.

### A Transportation Commissioner Provided

Power is conferred on the commission to select a transportation commissioner, resident of the city, who shall be the adviser of the commission in all matters of operation under the ordinance. The same safeguards are thrown around the selection of this commissioner as are placed about the appointment of members of the commission. The duty of the commissioner shall be to keep informed as to all conditions and elements affecting the costs, quality of service supplied, revenue, expenses, value of company's property, rate of fare and return yielded the company. The company shall supply offices for the commissioner and pay the expenses of the whole board, including the salary of the commissioner. The commissioner is to have access to all books and documents of the company relating to or bearing upon the operation of the company under the franchise.

If either the city or company is dissatisfied with the finding of the commission as to increase of service, extension or abandonment of lines, it shall have the right to have such finding submitted to arbitration. Notice of such action requires 30 days. One arbitrator is to be selected by the company, one by Council, and in event of failure to agree upon the third the presiding judge of the Court of Appeals is to make the selection. In arriving at their decision the arbitrators shall take into account that the company, under the franchise, is entitled to a reasonable return. The finding of the arbitration board is final.

The Transportation Commission controls paving requirements in case of new construction only. Old paving must be kept in repair by the company.

The company is to have the exclusive right under the franchise to operate street cars and buses over streets it occupies. The city agrees not to permit any one to operate buses or jitneys over these streets or in territory served by the company. Should the city fail to do this, the company has the right, at its option,

to terminate the contract with the company.

The right of purchase upon three-months notice is reserved to the city. Should the negotiators fail to agree upon a price, arbitration is provided upon the same basis as service arbitration. The city shall pay within six months the full cost fixed by the arbitrators, if it elects to be fully bound by the decision.

All tracks not now in use shall be removed or covered with pavement. This work shall be done under the supervision of the commission. Certain tracks on Market Avenue from Second Street south to Second Street north are to be removed immediately. Certain other tracks are to be relocated. Other tracks are to be brought to grade.

Right is reserved to the company to transport freight or express and to operate interurban passenger cars on such routes and during such hours as the Transportation Commissioner may direct, but such transportation shall be commensurate with the needs of manufacturing and business interests and with full regard to the safety and convenience of the traveling public. The company shall not be required to carry city passengers on interurban cars or buses.

All buses are to be brought through the public square, and a shelter station with safety approaches and zones is to be built, the company and city jointly sharing the cost. The station is to cost $40,000. It would be lighted, heated and maintained by the city.

The franchise provides that the company shall purchase all usable and useful buses and equipment, owned and in operation by individuals engaged in transportation service in Canton, as of Nov. 1. This requirement, however, is limited to such buses as may be approved in conference as being suitable for city service under the ordinance. An arbitration board shall settle all differences as to price. The board's finding shall be final.

A penalty of $50 a day is provided in the event the company fails to live up to the franchise provisions.

The present rate of fare in Canton is 6 cents cash, six tokens for 35 cents. The proposed franchise provides for a 10-cent cash fare, five tokens for 35 cents with a 5-cent ticket fare for school children, the tickets to be handled and sold by school officials. Free transfers are provided for continuous passage. The rates of fare fixed shall be binding for five years. After that period the company may either raise fares or surrender its rights under the ordinance, but must first give the city notice in writing six months in advance. Upon its part, however, the city has a year from the expiration of the five-year period to determine whether it will authorize the increase or permit the company to withdraw. During the year the fare is to remain unchanged. The provision covering the question of fares seems to offer the only possible stumbling block to the passage of the ordinance. Some members of the Council think the initial rate too high.

## Comment on Twin City Fare Proposal

Comment friendly to the Twin City Rapid Transit Company characterizes the editorials in the papers there, in discussing the plea of the company for increased rates. By this is meant that agreement is expressed with the idea that the company is entitled to a fair return, but at least one of the papers has doubt about the ability of the company to achieve this end through resort to the method it has proposed. As the Minneapolis *Journal* put it, the question is "whether another raise will not be followed by another falling off in business." This same commentator says, however, that if the company's figures are accepted, it is entitled to larger revenues. "If in Minneapolis," it adds, "the company is earning only 4.15 per cent on the actual investment, and in St. Paul only 2.56 per cent, the previously announced report of the commission that 7.5 per cent is a 'reasonable return' seems to make the railway's case unassailable." To this it adds:

> And as the commission itself fixed the fair values of the plants and equipment, and as the companies offer evidence that the average rate of street car fare in the United States is 1 cent higher than the local company's present rate, it has established a *prima facie* case.

In the course of comment in which it stresses the fact that the street car still remains an essential form of transportation, the St. Paul *Pioneer Press* says:

> A word of appreciation is due officials of the St. Paul Street Railway for the manner in which their application for a higher fare has been handled before the State Railroad & Warehouse Commission during the past six or seven months. Last spring a proposal was before the voters to relieve the company of its obligation to pave along the tracks of its property. This burden is relatively heavier in St. Paul than in Minneapolis. To equalize costs of operation between the two cities, a relief measure was indorsed by many public-spirited citizens. Because of long-standing antagonism toward the company, however, this proposal was defeated at the polls, thereby restoring the situation to the point at which it rested a year ago when the company applied for a separate increase in St. Paul. Since then the company has held its hand, and now makes its request for higher fare to apply in both St. Paul and Minneapolis.

That paper feels that one rate of fare for St. Paul and another for Minneapolis would be "illogical, absurd and unjust." It says that every consideration of common sense argues for unity of treatment of the matter in the two cities.

## Would Dismiss Injunction Suit in Indianapolis

Dismissal of a suit of the Indianapolis Street Railway, which asked a permanent injunction against officers of the Amalgamated Association, was sought in a motion just filed in federal court in Indianapolis. The injunction suit was brought in connection with the strike of employees in June, 1926. A temporary restraining order was issued against John M. Parker and Robert Armstrong, organizers, at that time, but hearing on a permanent injunction was postponed after both served 90-day sentences for contempt of court.

Attorneys for the railway told Judge Baltzell that the motion for dismissal was filed because the contract which the company had alleged would be violated in event of the strike, no longer is in effect, a new contract having been arranged with the employees. The court indicated a ruling would be made when a formal motion was presented in writing.

## Party for Juveniles in Akron

Free rides for the boys and girls! That is the gift of the Northern Ohio Power & Light Company, Akron, Ohio, to the youngsters who will attend the fun-fest on Dec. 22 at the Keith-Albee Palace Theater. Upon presentation of a party ticket the children will be permitted to ride free between the hours set aside preceding and immediately following the party. These tickets will not be collected by the operator, but will be retained by the children for admittance to the theater and for the return ride. The tickets will be distributed by mail.

In making the fun-fest accessible to all needy children, the company is cooperating with the *Beacon-Journal*, the Junior League and the management of the theater.

## All Opinions in St. Louis Wage Issue to Be Aired

Oral arguments of both sides in the wage controversy between the St. Louis Public Service Company, St. Louis, Mo., and its union employees, which is up for arbitration by the Missouri Public Service Commission, will be held at Jefferson City on Dec. 21. Testimony in the case was completed recently.

## Insurance Policies Christmas Gifts in Omaha

All of the 1,100 employees of the Omaha & Council Bluffs Street Railway operating in Omaha, Neb., and Council Bluffs, Ia., who have served a year or more will receive Christmas presents in the form of life insurance policies amounting to $500 without cost to them. Men who have completed two years of service will be insured to the extent of $750 while men whose service records date back three years or longer will be insured for the maximum amount of $1,000. The policies are being formulated by the Equitable Life Assurance Society of the United States.

According to C. D. Porter, vice-president and general manager, while it is optional with the company management to cancel any or all of these policies at any time, it is its intention to make this insurance plan permanent.

## Richmond Celebrates Again

**Virginia Electric & Power Company lauded in Chamber of Commerce gathering for its notable contribution to transportation development**

STONE & WEBSTER, INC., and the Virginia Electric & Power Company, operated under its management and awarded the Charles A. Coffin award for distinguished transportation service in 1928, were again honored in Richmond on Dec. 1 by state, city and Chamber of Commerce officials at a buffet supper in the Chamber of Commerce club rooms. Charles A. Stone and Edwin S. Webster, heads of the firm that bears their name, were the guests of honor. The Virginia Electric & Power Company was represented by William E. Wood and other officials, while Mayor J. Fulmer Bright, of Richmond, represented the city. State Tax Commissioner C. H. Morrissette was the official representative of Virginia, in the absence of Governor Harry F. Byrd.



**Left to right—C. F. Wetterer, Charles A. Stone, C. W. Kellogg, E. S. Webster and William E. Wood snapped at testimonial dinner**

Stone & Webster was lauded for the efficient service offered in Richmond and elsewhere in Virginia. Heads of the company, modestly refusing to accept credit for having won the Coffin award, passed on to the officials of the Virginia Electric & Power Company the high tributes paid by each of the speakers.

### President of Chamber of Commerce Welcomes Guests

E. B. Sydnor, president of the Richmond Chamber of Commerce, extended a welcome to the honor guests and the chamber members who gathered to express their appreciation for the service rendered by the Stone & Webster Company. John Stewart Bryan, publisher of the Richmond *News Leader* and twice president of the American Newspaper Publishers' Association, presided as toastmaster.

In calling attention to the fact that the award was made in part for the creation of a friendly public, Mr. Sydnor declared: "Gentlemen, this is a new day. To think that a great corporation places this as its first consideration!" In noting the rapid growth of Richmond from a city of 109,000 persons in 1908 to 200,000 in 1928, Mr. Sydnor said that the service rendered by the Virginia Electric & Power Company played an important part in this development.

### Mayor Speaks for Public

Mr. Sydnor presented the toastmaster, Mr. Bryan, who, in turn, introduced Mayor Bright, who pointed out that "the award means more than the people of Richmond realize." He continued: "We realize that the welfare of the city is in direct ratio to transportation development. Our program of improvement this year has resulted in 9 miles of paved streets." Some of this work, he explained, had been done upon streets upon which street cars operated.

Mr. Stone, the senior member of the firm of Stone & Webster, referred to the gathering as one unusual in his business experience.

Virginia's development, even as far back as the first permanent English settlement at Jamestown, was due largely to the transportation available, he said. He recalled that Virginia was the first state to have a complete system of canals and declared that he was pleased to find that Virginians still realized the importance of transportation. He expressed his appreciation to city officials and citizens of Richmond for the cooperation accorded the efforts of his company in their program of development.

Mr. Webster made a brief address, thanking the Chamber of Commerce and city officials for the recognition of his company's service and lauding Mr. Wood and other officials of the Virginia Electric & Power Company for their work in this city.

C. W. Kellogg, president of the Engineers' Public Service Company, and C. F. Wetterer, referred briefly to the work of the Virginia Electric & Power Company and the co-operation under whose management it is operated.

"Richmond, the new Richmond," said President Sydnor, of the Richmond Chamber of Commerce, in his talk, "was born in 1910. By that I mean the industrial Richmond, the city that now has a population of 200,000 persons." During that period, he said, the postal receipts had increased from $539,000 to $2,252,000 annually; the value of the city's manufactured products from $76,000,000 to $250,000,000, and its bank deposits from $31,000,000 to $136,000,000. Pointing to the state as a whole, Mr. Sydnor declared that during the past five years $150,000,000 in outside capital had been invested in Virginia. This, he said, amounted to more than had been invested during a 25-year period prior to 1923.

Mr. Morrissette, speaking for Governor Byrd, expressed regrets that the state's chief executive was unable to attend the function. He took advantage of the opportunity to review, briefly, the tax reforms of the state, and declared that Virginia's rapid development in recent years was due largely to such improvements.

### Mr. Herrman Also Honored

Among officials of the Virginia Electric & Power Company in attendance were Mr. Wood, president; T. Justin Moore, vice-president and general counsel; Thomas P. Walker, vice-president; J. M. Penick, manager of the railway division; T. Norman Jones, general manager of the Norfolk division; J. B. Hayes, manager of the Norfolk railway division; G. B. Williams, comptroller; R. J. Throckmorton, manager of the Richmond light and power department, and R. C. Foreman, of the personnel department.

Prior to the dinner on Dec. 1 A. H. Herrman, director of publicity and of public relations of the Virginia Electric & Power Company, Richmond, Va., was the honor guest of the Richmond Advertising Club on Thanksgiving Eve. He was lauded for his work in connection with the Charles A. Coffin award for 1928. William E. Wood, president of the Virginia Electric & Power Company, also was present.

## Hydro Asked to Cut Fares

Representatives of municipalities served by the Hydro-Electric Railways, Toronto, Ont., adopted a resolution recently, calling on the management to introduce a new and lower rate of fare. The joint transportation committee consented to a continuation of the 7-cent cash fare but called on the Hydro-Electric Commission to fix a ticket rate of nine for 50 cents, at once and retain it for a six-months' trial period.

Permission has been granted by the Indiana Public Service Commission to the Terre Haute, Indianapolis & Eastern Traction Company to cancel its bus operating certificate in Richmond, Ind.

# Recent Bus Developments

## East Penn Traction Would Buy Bus Company

The East Penn Traction Company, Pottsville, Pa., applied to the Public Service Commission on Dec. 12 for permission to acquire the controlling interest in the East Penn Transportation Company, which conducts a bus service in Schuylkill and Carbon counties. In the application it was said the bus company was incorporated in the interests of the traction company, and that stockholders of the East Penn Transportation would be reimbursed for their payments on subscriptions of stock.

## Akron Company Reacts Favorably to Petition

Upon request of a large number of Goodyear employees living adjacent to Copley Road and Maple Street in the western limits of Akron, Ohio, the Northern Ohio Power & Light Company has begun a new express bus line from the west side of the city to the Goodyear plants at the extreme eastern side of the city.

## Extension by San Jose Road

A certificate of public convenience and necessity has been granted by the Railroad Commission to San Jose railroads, San Jose, Cal., to operate auto stage service between Minnesota and Lincoln Avenues in the city of Willow Glenn, and Curtner and Lincoln Avenues in the County of Santa Clara.

## Boston to Maine Buses to Connect With Street Cars

The Boston & Maine Transportation Company, which operates the Boston & Maine bus and truck service, has obtained a permit from the Massachusetts Department of Public Utilities to run its buses into Boston. The Fitchburg-Cambridge line will be permitted to carry passengers to Park Square, which it has never been allowed to do before. Two restrictions are attached to the certificate, as follows:

That this certificate is issued upon the condition that vehicle operated hereunder shall not, when bound toward Boston, take on or admit passengers in Cambridge or Boston nor, when bound in the opposite direction, receive passengers to be discharged, nor stop to discharge passengers, in Boston or Cambridge.

That this certificate is issued upon the condition that the applicant shall with its vehicles make such connections with such railroads or street railways at such points as the department may from time to time order, and shall, in connection with said railroads or street railways, provide such through transportation upon its vehicles and upon such railroads or street railways and such joint rates therefore, as the department may from time to time order.

## Pittsburgh Buses No Bonanza

A. W. Robertson, president of the Pittsburgh Motor Coach Company, Pittsburgh, Pa., says that, contrary to some opinions, it is a difficult problem at best to make even a reasonable profit from the operation of that company. He cites the fact that the three months ended September, 1928, were probably the worst the company has experienced. One reason is that routes recently started have proved unprofitable.

STATEMENT OF PITTSBURGH MOTOR COACH COMPANY FOR JULY, AUGUST AND SEPTEMBER, 1928

| | |
|---|---|
| Total bus revenues (Fares and all other income) | $173,629 |
| Total expenses, taxes and licenses. (Paid out for wages, gasoline, oil, tires, etc.) | $184,667 |
| Loss from operations | $11,037 |
| Interest paid on borrowed money | $5,213 |
| Total loss for three months | $16,251 |

In slightly more than three years of operation the Pittsburgh Motor Coach Company shows on its books a surplus of only $72,363, a profit of 1½ cents per passenger carried. No dividends have been paid.

The total bus investment on Sept. 30, 1928, was $594,952. The amount earned for the twelve months ended Sept. 30, on this investment was $45,176, or 7.6 per cent. Mr. Robertson explains that, unfortunately, bus companies have more passengers than they can carry for a short time in the morning and evening and more buses than necessary at other times.

In the expenses for July, August and September is included an item of $31,665 for renewals and replacements. This establishes a fund to replace wornout buses and other equipment of the company. The money accumulated is used from time to time to buy new buses and other equipment. In this connection the president says:

If too much is set aside, the company would be able to buy more buses than were worn out. That would not be fair to the public. On the other hand, if not enough is set aside, the company cannot buy as many buses as are worn out. This would not be fair to the public or to the company.

The average useful life of the buses is estimated to be four years. None of the older buses have been run this long. We think the allowance is about right for the present ones. This money does not go out of the treasury of the company, so that no injustice is done, even though the amount for a given month is too high or too low, as the sum set aside can always be corrected by actual experience.

## Rehearing on Independent's Operation in Amsterdam

A rehearsing is scheduled before the Public Service Commission on Dec. 19, on the petition of the Fonda, Johnstown & Gloversville Railroad relating to the commission's order of Oct. 18, granting a certificate to Charles Vollmer for the operation of a bus line over certain streets in Amsterdam, N. Y. The railway alleges that since the granting of the certificate the trolley has suffered a material decrease in receipts on certain lines. It is further alleged that Mr. Vollmer is carrying passengers in parts of Amsterdam where he is prohibited under the terms of the certificate granted.

## Awaiting Bus Debut in Geneva

After 43 years of service the Geneva, Seneca Falls & Auburn Railroad has gone practically into the discard. It is continuing to operate with two large cars and one small car as the only rolling stock, in addition to the snowplow, sweeper and repair car. Other cars are being dismantled.

Although the Geneva Railway Bus Lines, successor to the trolley line, holds franchises to operate buses between and through Geneva, Waterloo, and Seneca Falls, no move has been made to place machines in operation. A fleet of buses is on the way and any day may see the trolley line abandoned and a bus schedule substituted.

Colonial Coach Lines, Inc., with headquarters in Watertown, will take over the local franchises and property of the Geneva Railway Bus Lines, as indicated when franchises were sought.

## Brooklyn Routes Under Discussion

The New York Transit Commission has announced no decision will be made until Dec. 19, although the 30-day period allowed the Equitable Coach Company for negotiations with Brooklyn-Manhattan Transit Company over Brooklyn bus routes expires on Dec. 15, indicating material progress is being made toward an agreement between the Equitable and the B.-M. T. in connection with bus operation in Brooklyn. It is reported the Brooklyn company will virtually take over the Equitable's franchise through purchase of a controlling interest in the company. As the franchise now stands, the Equitable must operate 55 per cent of the routes authorized by the Transit Commission.

## Temporary Suspension on St. Louis Line

The St. Louis Public Service Company, St. Louis, Mo., has discontinued its Sunday and holiday bus service on De Baliviere Avenue from Delmar Boulevard to the Jefferson Memorial Building in Forest Park. Service will be resumed next spring.

# Financial *and* Corporate

## 332-Mile Merger

**Cincinnati, Hamilton & Dayton to be nucleus for one of largest interurban systems in the United States**

THE Ohio Public Utilities Commission, on Dec. 10, authorized a merger of interurban railway and bus properties, serving Columbus, Springfield, Dayton, Lima and Toledo, with the Cincinnati, Hamilton & Dayton Railway into one system comprising 332 miles of track.

Involved in the deal, but not included in the consolidation, is the Lima Street Railway, ownership of which also passes to the Cincinnati, Hamilton & Dayton, but to be operated independently under present management.

Properties to be merged with the Cincinnati, Hamilton & Dayton are the Indiana, Columbus & Eastern Traction Company, operating between Columbus, Springfield and Dayton and between Springfield and Lima; the Lima & Toledo Railway, operating between those cities, and the Dayton & Columbus Transportation Company, operating buses from Dayton via Springfield to Columbus, and between Springfield and Lima.

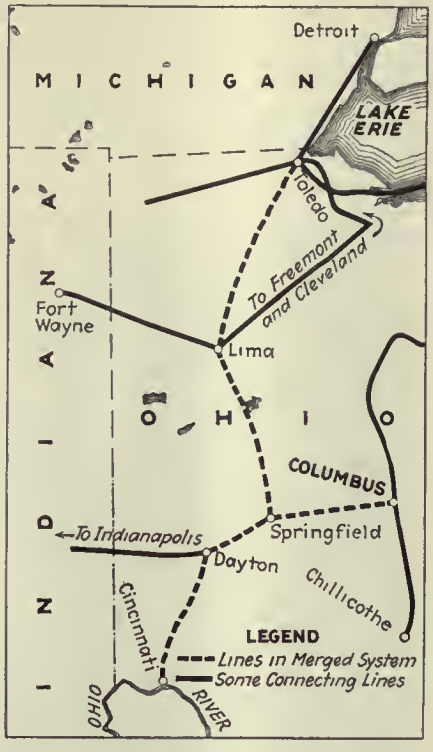
The merged system, including the parent company, which operates between Cincinnati, Hamilton and Dayton, will connect the Great Lakes at Toledo with the Ohio River at Cincinnati and extend as far eastward as Columbus.

### System Will Quicken Freight Deliveries

The control of the Cincinnati, Hamilton & Dayton after the consolidation will remain, as heretofore, in the hands of the Cincinnati, Hamilton & Dayton Corporation—a holding company organized some three years ago by the present management of the Cincinnati, Hamilton & Dayton.

The new consolidation is prompted by a purpose to supply up-to-date transportation for the people of Ohio. The capitalization of the Cincinnati, Hamilton & Dayton has been most conservative and will be continued on a like basis, its bonded debt representing, dollar for dollar, new capital invested during the past three years in the modernization of its property. A similar conservative course will be followed in capitalizing the much larger property. The bonded debt of the Indiana, Columbus & Eastern and the Lima-Toledo properties will be scaled from $9,181,000 to $1,390,750 and annual interest charges cut from $469,050 to $83,445. In brief, the Cincinnati, Hamilton & Dayton contemplates an extension of its methods and policies over a much wider territory. To this end it will seek to enlist co-operation on the part of the public, the municipalities, and the operating personnel.

It is expected that consolidation will markedly quicken freight deliveries and will make possible the provision of additional freight equipment, the extension of sidings, the enlargement of freight stations, and other facilities required. By creating a situation of economic stability, in place of the highly unstable situation now existing, and backed by its record of achievement, the Cincinnati, Hamilton & Dayton will be in a position to command the necessary new capital which the properties about to be taken over cannot themselves raise.




**Between "The Gateway to the South" and the Inland Lakes**

On the operating side it is expected substantial economies will be made possible, among them the elimination of many overhead expenses; the rearrangement of schedules, achieving in full measure the advantages of unified operation; the concentration of major repairs in the Cincinnati, Hamilton & Dayton's new carhouse and the reduction in freight loss and damage claims, in consequence of the elimination of much rehandling of freight, now required. The consolidation will remove many of the obstacles which heretofore have largely paralyzed the efforts of the officers of the properties lying to the east and north of Dayton, and will bring about not only a physical merger but a unification of effort and purpose which should galvanize the entire personnel to render ever better service to the public.

In this connection sight should not be lost of the fact that the physical and financial transformation of the Cincinnati, Hamilton & Dayton is one of the outstanding achievements of the last three years in the electric railway industry. Its passengers now ride over what is probably the finest interurban track in the State of Ohio. Its new all-steel passenger equipment embodies the latest developments in the car builders' art and affords the maximum degree of comfort and safety to the traveling public. Its passenger stations have been thoroughly rehabilitated. Eight new sub-stations supply adequate power at all points for the propulsion of its trains and have extensively reduced this very important element of operating costs. The Cincinnati, Hamilton & Dayton's new carhouse, situated at Moraine, Ohio, is equipped with every device necessary in connection with the maintenance of cars. In short, the Cincinnati, Hamilton & Dayton has been transformed, by the investment of more than $2,000,000 of new capital, from an obsolete, decrepit, interurban property to one of the most modern of electric railroad properties. It is the recognition of this willingness to work shoulder to shoulder in the solution of new problems along lines dictated by efficiency and the requirements of good service, that has enlivened public interest in the possibilities ahead of the roads to be taken over.

## Negotiations Begun for Sale of Omaha Bridge

President Shannahan of the Omaha & Council Bluffs Street Railway, Omaha, Neb., has begun negotiations with the committees named by the Councils of the two cities for the sale of the bridge connecting them. He is urging as the preliminary step that a price be agreed upon for the bridge first, after which the value of the lease may be taken up. The bridge company owns the bridge and the Council Bluffs lines, but is paid a net rental of $60,000 a year in excess of all interest charges by the railway on a ninety-nine year lease. The profits from the bridge are about $200,000 a year. The lease provides that if the Omaha & Council Bluffs Railway & Bridge Company cannot renew its franchise in Council Bluffs in 1947, the lease could then be terminated.

The Omaha & Council Bluffs Street Railway naturally attaches considerable value to its lease because of its profitable character. Moreover, the bridge company recently refunded a $2,000,000 bond issue. The Omaha company has a second lien for $893,000 for improvements, payable at termination of the lease. These are merely some of the angles to the matter. President Shannahan admits the difficulties are great, but feels they are not insuperable.

## Tacoma-Seattle Line to Cease Dec. 30

Formal notice has been filed with the State Department of Public Works at Olympia, Wash., by Scott Z. Henderson, receiver, calling for termination of operations of the Puget Sound Electric

Company's interurban line from Tacoma to Seattle on Dec. 30. The action is in compliance with an order issued by Federal Judge E. E. Cushman. The interurban has been in operation for 25 years, and has been steadily losing money in the last few years.

Sale of the property was recently postponed.

## Eighth Report on Rochester Operations

**Review of service-at-cost contract between city and New York State Railways shows continued trend of decreased riding**

ROCHESTER lines, New York State Railways, failed by $329 to make the 6 per cent return on operation during the year ended July 31, 1928, guaranteed under the service-at-cost contract with the city of Rochester, N. Y., according to the report of Railways Commissioner Charles R. Barnes to Mayor Joseph C. Wilson and the Council. This deficit is considerably less than the $60,128 deficit of the preceding year. However, the report points out, the accumulated deficit under the service-at-cost contract as of July 31, 1928, was $341,791. The contract between the railways and the city is for a ten-year period, expiring in August, 1930.

The deficit is mainly due to bus operation, which shows a loss of $60,105. Subway operation which began Jan. 1, 1928, shows an $8,123 deficit while the surface trolley lines returned a surplus of $67,898. Despite the deficit in the bus and trackless trolley operation, Commissioner Barnes declares that the service has justified itself through giving increased flexibility to the trolley system, opening new sections of the city and increasing the value of property. The losses are held "more apparent than real due to acceptance of street car transfers on the buses."

The report reveals a decrease in passengers over the previous year of 5,180,000 or 7.7 per cent. A table accompanying the report shows a steady decline each year since the inception of the contract system. This is blamed largely on the increased use of private automobiles.

The base valuation of the Rochester properties is shown to have increased to $20,314,905.

Relief from the "unjust burden" of street paving costs is urged in the report, which also recommends the increased use of one-man cars. The commissioner points out that of the fourteen lines in the city, on only two are one-man cars being operated. Extension of the use of this type to other lines, with increased headway in non-rush hours, is recommended.

A substantial part of the report is devoted to a résumé of the results of operating the new subway railroad, built by the city and run by the railways.

PASSENGERS CARRIED BY NEW YORK STATE RAILWAYS ROCHESTER LINES

| Year | Revenue Passengers | Total Passengers |
|---|---|---|
| 1920–1921 | 75,317,829 | 100,160,130 |
| 1921–1922 | 73,749,709 | 98,976,180 |
| 1922–1923 | 75,924,153 | 101,503,258 |
| 1923–1924 | 74,039,667 | 98,611,044 |
| 1924–1925 | 72,441,331 | 96,212,154 |
| 1925–1926 | 70,338,834 | 93,592,481 |
| 1926–1927 | 67,200,690 | 89,210,869 |
| 1927–1928 | 62,020,118 | 82,516,175 |

SUMMARY OF PASSENGERS CARRIED ON SUBWAY LINES

| Lines | Revenue | Transfer | Total | Passenger Revenues |
|---|---|---|---|---|
| Local | 380,321 | 107,504 | 487,825 | $33,343 |
| Rochester & Eastern | 342,962 | 67,562 | 410,524 | 23,389 |
| Rochester, Lockport & Buffalo | 112,723 | 34,333 | 147,056 | 7,084 |
| Rochester & Syracuse | 50,839 | 9,764 | 60,603 | 4,382 |
| Totals | 886,845 | 219,163 | 1,106,008 | $68,200 |

RESULTS FROM OPERATION OF ROCHESTER RAILWAYS CO-ORDINATED BUS LINES, INC., FOR THE YEAR ENDED JULY 31, 1928

| Revenues | Gasoline Buses | Trolley Buses | Total |
|---|---|---|---|
| Passenger revenues | $62,627 | $66,845 | $129,473 |
| Other transportation revenues | 215 | ..... | 215 |
| Miscellaneous operating revenues | 109 | 45 | 154 |
| Total operating revenue | $62,951 | $66,891 | $129,843 |
| Operating Expenses | | | |
| Maintenance of plant and equipment | $19,392 | $23,569 | $42,961 |
| Operating garage expenses | 34,563 | 16,374 | 50,938 |
| Transportation expenses | 24,247 | 19,510 | 43,758 |
| Administration and general expenses | 8,179 | 6,980 | 15,159 |
| Renewals and depreciation | 12,224 | 7,870 | 20,095 |
| Total operating expenses | $98,608 | $74,306 | $172,914 |
| Operating deficit | $35,656 | $7,414 | $43,070 |
| Taxes assignable to operation | 1,199 | 921 | 2,121 |
| Gross deficit | $36,855 | $8,336 | $45,191 |
| Return on investment | 7,053 | 7,860 | 14,913 |
| Bus operating deficit | $43,909 | $16,196 | $60,105 |

ACCUMULATED DEFICIT AS OF JULY 31, 1928

| | |
|---|---|
| Surplus from surface lines year ended July 31, 1928 | $67,898 |
| Deficit from subway lines eight months ended July 31, 1928 | 8,123 |
| Deficit from bus lines year ended July 31, 1928 | 60,105 |
| Service-at-cost deficit year ended July 31, 1928 | 329 |
| Accumulated deficit as of July 31, 1928 | $341,791 |

ROCHESTER LINES, NEW YORK STATE RAILWAYS FOR YEAR ENDED JULY 31, 1928

| | Surface Lines | Subways** | Total |
|---|---|---|---|
| Revenue from Transportation | | | |
| Passenger revenues | $5,069,579 | $56,733 | $5,126,312 |
| Chartered car revenues | 2,122 | ..... | 2,122 |
| Mail revenues | 87 | ..... | 87 |
| Switching revenues | ..... | 5,545 | 5,545 |
| Miscellaneous transportation revenues | 1,395 | 101 | 1,496 |
| Total revenue from transportation | $5,073,184 | $62,380 | $5,135,564 |
| Revenue from Other Railway Operations | | | |
| Station and car privileges | $61,644 | $317 | $61,961 |
| Rent from tracks and facilities | 25,100 | 2,409 | 27,510 |
| Rent from buildings and other property | 39,604 | ..... | 39,604 |
| Parcel room receipts | ..... | 348 | 348 |
| Total revenue from other railway operations | $126,349 | $3,075 | $129,424 |
| Total Railway Operating Revenues | $5,199,533 | $65,455 | $5,264,988 |
| Railway Operating Expenses | | | |
| Maintenance of ways and structures | $500,985 | $5,558 | $506,543 |
| Maintenance of equipment | 368,299 | 7,479 | 375,779 |
| Power | 278,821 | 9,875 | 288,697 |
| Conducting transportation | 1,613,402 | 33,418 | 1,646,820 |
| Traffic expenses | 13,242 | 831 | 14,073 |
| General and miscellaneous expenses | 568,137 | 13,299 | 581,437 |
| Renewals and depreciation | 300,000 | ..... | 300,000 |
| Total railway operating expenses | $3,642,889 | $70,462 | $3,713,351 |
| Net Operating Revenue | $1,556,644 | *$5,007 | $1,551,636 |
| Auxiliary operating revenues | $1,080 | ..... | $1,080 |
| Auxiliary operating expenses | 2,322 | ..... | 2,322 |
| Auxiliary operating deficit | $1,241 | ..... | $1,241 |
| Net operating revenues | $1,555,402 | *$5,007 | $1,550,395 |
| Taxes assignable to operation | 308,785 | 327 | 309,112 |
| Operating income | $1,246,617 | *$5,334 | $1,241,282 |
| Non-operating income | 8,385 | ..... | 8,385 |
| Gross income | $1,255,002 | *$5,334 | $1,249,667 |
| Return on investment | 1,187,103 | 2,788 | 1,189,892 |
| Railway Operating Surplus | $67,898 | *$8,123 | $59,775 |

*Denotes deficit. **Figures on subway operation are for a period of eight months.

## Would Shorten One Line in Rome

The New York State Railways applied, on Dec. 4, to the Public Service Commission for approval of a declaration of abandonment of a part of its line in Rome, a distance of 3095 feet. It is alleged that this part of its road is no longer necessary for adequate and successful operation or for the convenience of the public.

## Rate of Return Reduced in California Case

The Railroad Commission of California has found unanimously that a rate of return of 7 per cent per annum on the capital invested, in the case of a stable and established utility like Southern Counties Gas Company is reasonable, instead of allowing a return of 7½ or 8 per cent, as heretofore. This action was taken in fixing the rates for service of natural gas in Ventura City and County by that utility.

The decision marks a precedent in favor of 7 per cent rate of return on the capital invested by a public utility, in view of the "marked decline in the cost of money" during the last few years. The commission held that with the lower rate of return it would be

possible for the utility to obtain the needed capital to function properly.

The commission fixed rates upon a basis estimated to result in a total reduction of approximately $50,000 a year to consumers throughout the area served. However, certain of the so-called convenience users of gas will have their bills increased slightly, due to the establishment of a service charge.

The commission found that a rate base of $1,350,950 would be reasonable for the company, or approximately $68,000 less than the amount claimed by the company.

## Another Move Made Against Philadelphia Underliers

The Council of Philadelphia has sent to the committee on transportation and public utilities the resolution on proposed city condemnation of the P.R.T. underliers. The measure would authorize the City Solicitor to ask Common Pleas Court whether such city debts as may arise from purchase of the underliers will not constitute a burden against municipal borrowing power. Prior to introduction of the Mayor's resolution, communications from the Public Service Commission and President R. T. Senter, of the P.R.T., were read. The commission indicated that it would approve a purchase agreement based on the underlier valuation of $139,000,000, plus the $10,000,000 mortgage on the Market Street subway. Mr. Senter offered assurance that the P.R.T. will continue to pay the city the rentals that are now paid to underliers if the city buys the franchises.

## Kansas Sale Indefinitely Off

Owing to a better situation in local business in Pittsburg, Kan., the sale of the Joplin & Pittsburg Railway has been indefinitely postponed. It had been announced by John F. Layng, general manager for M. H. McLean, receiver, that all the properties of this company would be offered for sale on Dec. 1. The sale was to be made on orders from the federal court for the Western District of Missouri.

## $16,800,000 Intercompany Transaction in Brooklyn

The board of directors of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., on Dec. 7 authorized the sale to the Chase Securities Corporation, Hayden, Stone & Company and J. & W. Seligman & Company of $16,800,000 principal amount of the New York Rapid Transit Corporation's refunding mortgage 6 per cent sinking fund gold bonds, series B. They were authorized some time ago by the transit commission to be issued by the New York Rapid Transit Corporation because of extensive purchases of new cars and other capital betterments, and to be sold to the Brooklyn-Manhattan Transit Corporation.

# Personal Items

## V. S. Shinkle Resigns

Vincent G. Shinkle, secretary and treasurer of the Spokane United Railways, Spokane, Wash., resigned on Dec. 1. In announcing his resignation Mr. Shinkle said he wanted to gratify his life-long ambition to travel. He plans to visit California shortly and then Europe.

Mr. Shinkle entered the employ of the Washington Water Power Company on July 1, 1907, as storekeeper. Two years later he became purchasing agent and on June 1, 1918, he was made secretary-treasurer. When the Spokane United Railways was formed on July 1, 1922, he was named secretary and treasurer of that company.

## I.C.C. Nominees Go to Senate

The nomination of Patrick J. Farrell of Vermont and the District of Columbia to be a member of the Interstates Commerce Commission was sent to the Senate on Dec. 6 by President Coolidge. Mr. Farrell is to succeed Commissioner John J. Esch.

Nominations of Claude R. Porter of Iowa and Clyde B. Aitchison of Oregon to be members of the commission also were sent to the Senate. The last two are reappointments.

## Transit Counsel C. M. Lewis Resigns

Clarence M. Lewis, counsel for the New York Transit Commission since July 1, 1926, resigned on Dec. 3 for "private and personal" reasons.

His first step after his appointment was a complete reorganization of the commission's law department. Prior to his appointment to the commission he was a member of the Home Rule Commission and was at one time chairman of the legislative committee of the Citizens' Union and chief counsel to the State Housing Commission. He is the author of several law books.

## Walter Burke Praised for His Work in Southwest

Fitting tribute is paid by *Cactus Points*, published by the El Paso Electric Company, to Walter H. Burke, district manager for Stone & Webster in the Southwestern district, since April, 1927, who was recently transferred to the company's Boston office. The El Paso paper says that Mr. Burke "represents the type of keen official whose youth and vigor is in keeping with the electrical industry."

Fifteen years ago he was a student engineer in the Boston office, later being made clerk to the manager at Dallas. At that time the light, power and transportation company at Dallas was operated under the executive management of Stone & Webster, Inc. Following the change here, Mr. Burke went back to the Boston office and for seven years was assistant to the division manager in charge of the Southwestern district.

In this position he gained valuable experience and was made manager at Keokuk, Iowa. Subsequently he became manager at Houghton, Mich., going to Texas from the North. Mr. Burke was made manager of the Northern Texas Traction Company at Fort Worth in July, 1925, and in April, 1927, became manager of the Southwestern district, with headquarters in Houston.

While in office as manager of the district, he made many friends among the personnel of the various companies. *Cactus Points* says that in leaving the Southwest district Mr. Burke has the best wishes of the officials and employees of the El Paso Electric Company.

## A. W. Koehler with Safety Body

A. W. Koehler was recenty appointed secretary of the National Conference on Street and Highway Safety. Mr. Koehler has a record of effective service in organization and accident prevention work.

At Purdue University Mr. Koehler specialized in industrial engineering, and after he was graduated in 1916 he saw service for several years in accident prevention and industrial relations work with the Commonwealth Steel Company, Granite City, Ill., and the Atlantic Steel Company, Atlanta, Ga. During the World War he went into the Naval Service, received an officer's commission and was assigned to engineering duty. Since the war he has served as executive secretary of the Safety Council of the Rochester Chamber of Commerce, and subsequently as head of the accident prevention work of the railway systems of Rochester, N. Y., and Milwaukee, Wis.

In making the announcement, Col. A. B. Barber, director of the conference, pointed out that the appointment is an indication of the increased activities which the National Conference on Street and Highway Safety is undertaking as an outgrowth of the completion of the Uniform Vehicle Code, the Model Municipal Traffic Ordinance and other measures for promoting nation-wide uniformity of traffic regulations and assistance in dealing with the problems of street and highway traffic.

J. L. Campbell was appointed chief engineer of the Northwestern Pacific Railroad, San Francisco, Cal., effective Nov. 1, 1928.

# Edward Jones Pearson

**President of New Haven had confidence in company's electric railways and approved program providing for their rehabilitation. Was quick to appraise bus**

EDWARD JONES PEARSON, who retired recently as president of the New York, New Haven & Hartford Railroad, died suddenly on Dec. 7 at the Johns Hopkins Hospital in Baltimore.

It was in April, 1916, that he went to the New York New, Haven & Hartford Railroad, and after serving for thirteen months as vice-president, he succeeded the late Howard Elliott as president of the road.

At that time the work of rehabilitation of the New Haven was only just beginning to get well under way. In 1913 the dividends on common stock had been suspended, the morale of the personnel was at ebb and the system was pretty generally discredited with the public in the communities which it served.

Into this situation, first as vice-president and then as president, Mr. Pearson threw himself with the full vigor characteristic of the man, with the result that his entire term of office was one of progress. Separate operation had been arranged for the lines of the Connecticut Company, but when the matter of the possible disposition of the local railways in Springfield and Worcester came up for settlement, Mr. Pearson, through Vice-President Buckland, announced the confidence of the New Haven management in the local railway situation there by pledging the railroad to the expenditure of several million dollars for rehabilitation, in order that these properties might be converted into the earners he visualized them rightly to be.

Not only that, but in the midst of the general program of reclamation of the entire system came the bus with its threat of competition. One would think that Mr. Pearson's experience in knitting together the loose ends of the transportation empire embracing steam lines, trolleys and steamships, which had gone almost completely to smash, would have made him hesitate in his attitude toward the newcomer. He did, but not for long. Then he entered upon the program under which the bus has been converted into an ally to an extent that makes the New England Transportation Company, the New Haven's bus operating subsidiary, with its 400 vehicles, certainly the biggest operator in that respect, if not in actual route miles, among the steam railroads. It was not diversity of activity that had brought the New Haven to the brink of ruin, but lack of co-ordination that had helped to invite disaster. That Mr. Pearson and his associates were convinced of this, appears to be attested beyond a doubt by the evidence in both of these cases.

One of Mr. Pearson's greatest achievements was in inducing the business men and bankers of New England to raise money among themselves to prevent foreclosure. After five years of uphill fighting, the private offering of $23,000,000 of 6 per cent bonds to refund the issue maturing April 1, 1925, was over-subscribed. Mr. Pearson saw in this novel experiment in railroad financing the beginning of a new era of co-operation between the industries of the section and the railroad.

And the record of the man is all the more remarkable, since of the arts by which popularity is commonly secured he had not a trace, but he had as friends those who were doing their work in the spirit with which he did his—for the sake of the thing to be accomplished and not for personal remuneration. It was well said of him by his associate on the New Haven board, Arthur T. Hadley, president emeritus of Yale, that in every part of the country, north, south, east and west, the name of Mr. Pearson is gratefully remembered by his fellow-workers from chief engineer down to trainman. Mr. Hadley said:

> Two years ago we saw that he was beginning to wear himself out, and besought him to take a well-earned rest, but he was not the man to rest while his work for others was undone. Only when he saw light ahead, saw that the heaviest part of his work was done and that he might safely confide the future to others, was he willing to think of rest, and then it was too late for him to enjoy the fruition of his hopes and plans, not too late for him to have received that profoundest enjoyment which comes from the confidence and loyalty of those who have worked with him and under him.

Mr. Buckland said:

> It is not easy at a time like this to say what one feels regarding the loss of a leader and a friend. Mr. Pearson was more than leader and friend; he was a comrade—loyal, inspiring and generous. Mr. Pearson's administration was a striving against and mastering of overwhelming odds. We, who were associated in his service, are proud to have served under him; we shall cherish in our memories his years of service and comradeship.

Edward Jones Pearson was born in Rockville, Ill., on Oct. 4, 1863. He received his early education in the West and came to Cornell University for his technical training, obtaining in 1881 the degree of Bachelor of Science in civil engineering. In the year of his graduation Mr. Pearson got a job as a rodman with the Missouri Pacific and began a career of railroad building.

He then became chief engineer of the Pacific Coast Extension of the Chicago, Milwaukee & St. Paul, remaining until June 1, 1911, when he became first vice-president of the Missouri Pacific and the St. Louis, Iron Mountain & Southern railways, in which capacity he served until April, 1915. For one year following he was first vice-president of the Texas & Pacific.

On Nov. 27 when the New Haven was returned to a regular dividend basis, President Pearson offered his resignation because of the state of his health. His resignation was accepted, but no successor was named.

## J. J. Sullivan

Jeremiah J. Sullivan, at one time a leader of railway interests in Philadelphia, Pa., and other parts of the country, died in Philadelphia on Dec. 11. For many years before his death he had been president of the Union Traction Company, Philadelphia, and also of the Frankford & Southwark Philadelphia City Passenger Railroad of which he was president for twenty-eight years. In 1890 he bought the Lehigh Avenue Passenger Railway and later participated in the formation of new companies and the mergers of others.

In addition to his local railway interests, Mr. Sullivan at the time of his death was president of the Scranton Railway, the Altoona & Logan Valley Railroad and the Bridgeton & Millville Traction Company. Not long ago he resigned from the presidency of the Chicago & Joliet Electric Company. Besides his street railway affiliations he was one of the founders of the Philadelphia Electric Company and had been a member of the board of directors from its beginning.

Mr. Sullivan was born in County Cork, Ireland, ninety years ago. He completed a business course at Crittenden College, later going into the wholesale dry goods business with his brother and forming the firm of Sullivan & Brother in 1860. A few years later he became interested in the promotion of various street railways which obtained long-term operating rights to the city streets, but are now included in the system of the Philadelphia Rapid Transit Company, which runs them under lease.

HENRY INNES ROGERS, the head of the firm of Brecknell, Munro & Rogers, well-known British manufacturers of electric tramway fittings, died recently. In his earlier years he installed electricity on a number of tramways for various firms. Later he became chairman of Brecknell, Munro & Rogers, pioneers in their business. In recognition of his services in the production of munitions during the war, he was made a member of the Order of the British Empire.

DANIEL J. MCDONALD, night depot master at Flatbush depot of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., for more than thirteen years, died recently. He was appointed a motorman on Feb. 13, 1896, at the Flatbush depot. On Dec. 3, 1909, he was promoted to line inspector.

VICK N. FLOWERREE, former assistant general manager of the Kansas City, Leavenworth & Western Railway, Kansas City, Mo., died on Nov. 13 in Los Angeles. He was for many years connected with the old Metropolitan Street Railway, Kansas City.

# Additional Equipment Orders Planned

## Chicago Railways plans purchase of 100 new cars. Track construction projected in Seattle. Brooklyn subway construction program expedited

COINCIDENT with the beginning of the winter months, the volume of orders for material and supplies continues to decrease, according to reports received from a number of electric railways. At the same time, however, additional improvement programs continue to be made.

Permission to purchase 100 new street cars at an estimated cost of $1,725,000 has been asked in a petition filed recently in the Federal District Court of Chicago, by Henry A. Blair and Frederick H. Rawson, receivers for the Chicago Railways Company. The hearing on the application will be held on Dec. 20. The petition recommends a front-entrance, center-exit type of car, designed to seat 61 passengers, as compared with a capacity of 51 passengers in the most recent type of equipment placed in service by the Chicago Railways. The cost of the new cars, it is proposed, shall be met out of the special equipment fund of the Chicago Surface Lines, established by order of the Illinois Commerce Commission in 1920. The average cost of the 496 cars previously purchased was $15,289, as compared with an estimate of $17,250 for each of the new units.

Chicago Railways, which operates on the north and west side surface lines in Chicago, has been in receivership under the jurisdiction of Federal Judge James H. Wilkerson since January, 1927. In their petition, the receivers point out that no new passenger equipment has been acquired by the railroad since 1926 and the number of revenue riders in that time has increased about 17,000,000 annually.

### Seattle Construction Planned

Immediate appropriations to finance new construction necessary for the rerouting of West Seattle street cars into the business district over First Avenue South, and possibly for building a new line on Fourth Avenue from Spokane Street to Dearborn Street, was asked by the Seattle Municipal Street Railway, Seattle, Wash. It is estimated that it will cost approximately $99,000 to do away with the so-called Whatcom Street elevated, and switch the West Seattle cars to First Avenue. Approximately $80,400 must be spent for replacing rail and incidental paving on this avenue, between Spokane and Stacey Streets. These figures are part of the $244,000 worth of reconstruction and repair work contemplated by the railway at once.

Against the recommendation of Superintendent Avery, the Seattle City Council has voted unanimously to order the construction of a single-track extension of the Beacon Hill street car line. This has been petitioned for repeatedly by the residents of that district. A single-track line extension to Columbian Way which was ordered at this time, will cost $23,210 and to Graham Street, $42,250. Another step in the proposed city-wide improvement program for the street railway system, which will give a closer transportation service to a thickly settled area of more than a square mile in the northwestern part of the city, is the construction of a new street car line to be built along Eighth Avenue, northwest from Leary Avenue to the north city limit at West 85th Street. This work will cost $100,000 and is to begin early in the coming year.

### Brooklyn Subway Project

The chairman of the New York Board of Transportation announced recently at a public hearing on the form of contracts to be let for the construction of the proposed Fulton Street subway in Brooklyn, between Lafayette and Alabama Avenues, that work on the line, in all probability, will be under way by the middle of next year. The section of the line to be started first extends about 1½ miles from Lafayette Avenue to Nostrand Avenue. The program calls for the beginning of work beyond Nostrand Avenue to Alabama Avenue as soon as designers can be released from work on the first section.

This construction will be made by the cut and cover method, and an effort will be made to avoid disturbances of sidewalks and highways as much as possible. Surface car operation in the street will be maintained during construction and the Fulton Street elevated structure will be supported as were such structures in Manhattan during similar operations. The stations will be among the largest on the new city-owned subways and will be built with entrances at street corners at each end, and will be equipped with automatic turnstiles. The subway as planned will have four tracks, providing for express service.

### Milwaukee Subway Started

Excavation work has been started on the rapid transit and subway project to cost $4,000,000 in the west section of greater Milwaukee by the Milwaukee Electric Railway & Light Company. The operation marks the first step in the actual construction of the new line, which will extend along the north side of the Menomonee Valley on a private right-of-way to Eighth Street and St. Paul Avenue, where the subway starts. The new route covers a distance of 2.8 miles.

The grading work will be pushed as rapidly as possible to 30th Street, and eastward from there as soon as the necessary land is acquired. It is estimated that the overground part of the line can be finished in about eighteen months, and a year will be required for the subway. Double tracks will be laid as the grading progresses and provision will be made for the laying of an additional pair of tracks in the future.

In taking over the Windsor, Essex & Lake Shore Railway, Kingsville, Ontario, the Ontario Hydro-Electric Power Commission has undertaken to provide the new management with $100,000 working capital, and also to place $700,000 to the credit of the management in the bank so it will be available for road improvements. As soon as these undertakings are carried out, the Ontario Hydro Commission will take over the management of the road.

All rapid transit lines through the city of Evanston, Ill., are now operated on the temporary elevated structure which has been completed by the Chicago Rapid Transit Company, Chicago, Ill. This new structure eliminates twelve grade crossings and clears the way for construction of the permanent structure which has already been started with the grading of crossings at Ridge Avenue and Lincoln Street. These streets are to be open under the elevated structure. Crossings at these locations were formerly elevated over the surface tracks of the railway.

### Line Materials in Demand

Pittsburgh Railways, Pittsburgh, Pa., contemplate the purchase of 40 miles of No. 00 round copper trolley wire, 160 30-ft. creosoted yellow pine poles, and eighteen 45-ft. creosoted pine poles. Among line materials ordered by this company, are 100,000 ft. of No. 8 weatherproof copper wire, 2,500 16-in. No. 0000 rail bonds, 1,500 ft. of $\frac{7}{16}$-in. copper weld span wire, 9,000 ft. of $\frac{5}{16}$-in. copper weld span wire, 45,000 ft. of $\frac{1}{4}$-in. copper weld span wire, and 85 No. 8 cone anchors. The miscellaneous line material ordered by this company includes six electric track switches with T-3 ground box and circuit changers, 40 universal frogs, 30 No. 00 solid crossings, 250 midget train insulators, 600-500,000 circ.mil. straight line insulators, 300 1,000,000 circ.mil. corner insulators, 150 No. 00 cam tip approaches, 100 No. 00 renewable approaches, 50 double curve suspensions, 50 molded insulators, five type C friction insulators, and seventeen type LCD floodlight projectors.

Line materials ordered by the Chicago Surface Lines, Chicago, Ill., include 500

No. 0000 9-in. bonds, 500 No. 000 left-hand, and 300 right-hand malleable switches with 6-in. approaches, and 200 No. 000 90-deg. rigid galvanized malleable iron crossovers complete with 6-in. brass renewable tips. Track and construction material ordered by this company includes 400 7-in. fishplates, 200 Arrow sledgehammers, 500 concrete points, 100 Toledo bombshell torches, 300 African bass push brooms, 400 16x2¾x1¾-in. grinding wheels, and 400 Dietz lanterns with ruby globes.

### Track Equipment Ordered

Track material ordered by Pittsburgh Railways include 10,000 white oak ties, 15,000 creosoted ties, 155 tanks of oxygen, 50 tanks of acetylene, 30 kegs of boat spikes, 45 kegs of track bolts, 20 pair of 18-ft. switch points, 20 pair of 7-in. joint plates, 30 drums of Tarmac, one carload of molding sand, 20 sewer drops, six carloads of lumber, namely 2-in., 3-in., 4-in. white oak, and 4x6-in. stringers, and two cars of ½-in. screening.

This company has ordered one set of rewinding material for an 1,800-kw. 600-volt, six-phase rotary converter and one set of armature coils for a direct-current generator of 1,000-kw. 550-volt capacity. Among some equipment ordered are two Blecker blacksmith hammers. Seven 4,300 type low-floor, center-entrance cars, are being remodeled for one-man operation.

New revolving chairs have been ordered for installation in the parlor observation cars of the Chicago South Shore & South Bend Railroad, Michigan City, Ind. The chairs will be of the latest type, set at a convenient angle and free to be completely revolved at the passenger's will. Installation of these chairs in the parlor cars is expected to be completed shortly after the first of the year.

Pittsburgh Railways has ordered two 29-passenger Yellow coaches and three 21-passenger Yellow coaches. The Illinois Power & Light Corporation, Decatur, Ill., will replace five of its old buses with new ones costing approximately $8,000 a piece. The old buses will be remodeled for trucking purposes.

The Boston Elevated Railway plans a repair shop 85 ft. x 150 ft. to cost approximately $100,000 with equipment and boiler house.

## Detroit Car Order Signed

The contract for the purchase by the Detroit Street Railway of 100 street cars from the Perley A. Thomas Car Works, High Point, N. C., has been formally signed. While Commissioner of Purchases Joseph E. Mills, appearing before the council, informed that body that deliveries would be speeded up, the contract does not alter in any way the original bid of the company. The Thomas company was the low bidder, but it was contended that its offer did not conform with specifications. The case is now before the Michigan Supreme Court.

## 1928 Improvement of Union Traction

Indicative of the improvement program of the Union Traction Company of Indiana, Anderson, Ind. are the purchases made during the year 1928 by this company. Track materials ordered during the year include ten carloads of rail, 70,000 Northern white cedar ties, 30,000 creosoted ties, one carload of tie plates, one carload of joint plates, three carloads of spikes and one carload of bonds. Track construction and maintenance equipment purchased include two hand cars, one gasoline car, a rail drill, an electric welder and similar maintenance equipment. Overhead line material ordered include three carloads of trolley wire, one carload of hard drawn bare wire, one carload of insulated wire, 2,000 poles, two carloads of insulators, overhead frogs and crossovers and line department equipment sufficient for regular maintenance.

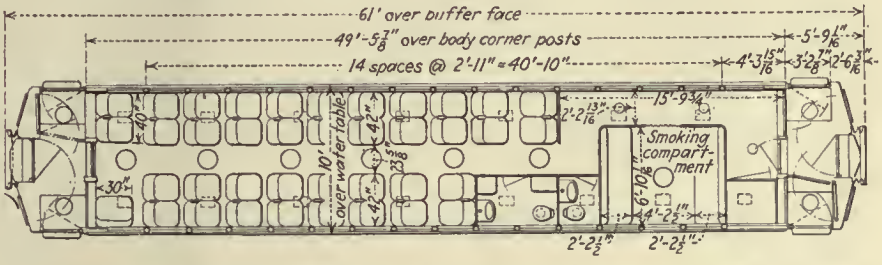
All interurban and city cars were repainted and fifteen cars were remodeled and rebuilt. It is contemplated to purchase from ten to twenty one-man cars in high grade used condition for several short lines on the road. This company purchased nine used White buses which were remodeled and rebuilt in first-class operating condition. All buses of the system were thoroughly overhauled, repainted and placed in good condition. Ten rebuilt freight cars and approximately ten flat bottom gravel cars were purchased.

Shop and garage equipment purchased included three battery charging outfits, two air pumps and small supplies of equipment necessary for the operation of three bus garages. All buildings were remodeled with the addition of new roofs, floors, etc.

## Specifications on Cars for South Shore Line

Chicago, South Shore & South Bend Railroad, Michigan City, Ind., has ordered ten more steel passenger cars, as mentioned in Electric Railway Journal of Nov. 10. Five of these cars are motor equipped and five are of the trailer type. They are similar to the former order of cars and are being built by the Standard Steel Car Company, Hammond, Ind. They are the double-end, double-truck type designed for operation by two men in interurban passenger service. Each car is 61 ft. long, 10 ft. 1¼ in. wide, and weighs 133,600 lb. fully equipped. The bodies are of all-steel construction with arch roofs and swinging end doors, and seat 48 passengers. They are finished in orange and maroon lacquer, the interior finish being mahogany. The seats are attractively finished in plush with leather trim. Brass sash ventilators are installed in the lower rail and each car is equipped with a Pullman style smoker.

The trucks are equipped with two inside-hung motors and 36-in. rolled steel wheels. Both the armature and journal bearings are of plain type. Further details of the motor cars are given in the accompanying specifications. The trailer cars are similar in construction.




**A Pullman type smoking compartment is included in the new cars being built for the Chicago, South Shore & South Bend Railroad**

| | |
|---|---|
| Weights: | |
| Car body | 67,500 lb. |
| Trucks | 33,400 lb. |
| Equipment | 12,700 lb. |
| Motors | 20,000 lb. |
| Total | 133,600 lb. |
| Bolster centers | 38 ft. |
| Length over all | 61 ft. |
| Length over body posts | 49 ft. 6¼ in. |
| Truck wheelbase | 7 ft. |
| Width over all | 10 ft. 1¼ in. |
| Height, rail to trolley base | 13 ft. 1 in. |
| Date of order | Oct. 1, 1928 |
| Date of delivery | March, 1929 |
| Window post spacing | 35 in. |
| Body | All steel |
| Roof | Arch |
| Doors | Swinging end |
| Air brakes | Westinghouse AMU |
| Armature bearings | Plain |
| Axles | Heat-treated steel 5½x10 in. |
| Car signal system | Electric Service Supply Company 32 volts |
| Compressors | Westinghouse D-3-F |
| Conduit | Metal |
| Control | Westinghouse HBF 1,500 volts |
| Couplers | Tomlinson form 23 |
| Curtain fixtures | Railway Curtain Supply Company |
| Curtain material | Pantasote |
| Destinatio n signs | Hunter |
| Energy saving device | Sangamo kwh meters |
| Finish | Sherwin Williams lacquer |
| Floor covering | Linoleum and rubber tile |
| Gears and pinions | Westinghouse grade BP |
| Glass | Plate |
| Hand brakes | Peacock Staffless |
| Heat insulating material | Balsom wool |
| Heaters | Railway Utility, electric |
| Headlights | Golden Glow, portable |
| Headlining | Aluminum |
| Interior trim | Mahogany |
| Journal bearings | Plain |
| Journal boxes | Symington |
| Lamp fixtures | Adams & Westlake |
| Motors | Four Westinghouse 567C, inside hung |
| Painting scheme | Orange and maroon |
| Roof material | Canvas covered poplar |
| Safety car devices | Deadman control-Westinghouse |
| Sash fixtures | O. M. Edwards |
| Seats | Hale and Kilburn No. 900 |
| Seat spacing | 35 in. |
| Seating material | L. C. Chase Byzantine plush, leather trim |
| Slack adjusters | Westinghouse form "J" |
| Steps | Stationary |
| Step treads | Saf-Kar treads |
| Trucks | Bladwin |
| Ventilators | Railway Utility Company |
| Wheels, type | Rolled eteel, diameter 36 in. |
| Wheelguards or fenders | Steel pilot |

## ELECTRIC RAILWAY MATERIAL PRICES—DEC. 11, 1928

### Metals—New York

| | |
|---|---|
| Copper, electrolytic, cents per lb. | 15.775 |
| Lead, cents per lb. | 6.5 |
| Nickel, cents per lb., ingot | 35.00 |
| Zinc, cents per lb. | 6.7 |
| Tin, Straits, cents per lb. | 49.5 |
| Aluminum, 98 or 99 per cent, cents per lb. | 23.90 |
| Babbitt metal, warehouse, cents per lb.: | |
| Commercial grade | 53.00 |
| General service | 31.50 |

### Bituminous Coal

| | |
|---|---|
| Smokeless Mine Run, f.o.b. vessel, Hampton Roads, gross tons | 4.375 |
| Somerset mine run, f.o.b. mines, net tons | 1.875 |
| Pittsburgh mine run, Pittsburgh, net tons | 1.8 |
| Franklin, Ill., screenings, Chicago | 1.425 |
| Central, Ill., screenings, Chicago | 1 15 |
| Kansas screenings, Kansas City | 1.625 |

### Track Materials—Pittsburgh

| | |
|---|---|
| Standard steel rails, gross ton | $43.00 |
| Railroad spikes, drive, ⅝ in. and larger, cents per lb. | 2.80 |
| Tie plates (flat type), cents per lb. | 2.15 |
| Angle bars, cents per lb. | 2.75 |
| Rail bolts and nuts, cents per lb. | 3.90 |
| Steel bars, cents per lb. | 1.95 |
| Ties, white oak, Chicago, 6 in.x8 in.x8 ft. | $1.40 |

### Hardware—Pittsburgh

| | |
|---|---|
| Wire nails, base per keg | 2.55 |
| Sheet iron (24 gage), cents per lb. | 2.8 |
| Sheet iron, galvanized (24 gage), cents per lb. | 3.55 |
| Galvanized barbed wire, cents per lb. | 3.20 |
| Galvanized wire, ordinary, cents per lb. | 3.00 |

### Waste—New York

| | |
|---|---|
| Waste, wool, cents per lb. | 18. |
| Waste, cotton (100 lb. bale), cents per lb.: | |
| White | 17.25 |
| Colored | 13.5 |

### Paints, Putty and Glass—New York

| | |
|---|---|
| Linseed oil (5 bbl. lots), cents per lb. | 10.4 |
| White lead in oil (100 lb. keg), cents per lb. | 13.25 |
| Turpentine (bbl. lots), per gal. | $0.65 |
| Putty, 100 lb. tins, cents per lb. | 5.725 |

### Wire—New York

| | |
|---|---|
| Copper wire, cents per lb. | 17.875 |
| Rubber-covered wire, No. 14, per 1,000 ft. | 5.3 |
| Weatherproof wire base, cents per lb. | 17.125 |

### Paving Materials

| | |
|---|---|
| Paving stone, granite, 5 in., f.o.b. New York—Grade 1, per thousand | $150 |
| Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd., f.o.b. | $2.70 |
| Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots, f.o.b. | 51.00 |
| Paving brick 3x8½x4, N. Y., per 1,000 in carload lots, f.o.b. | 45.00 |
| Crushed stone, ¾-in., carload lots, N. Y., per cu.yd., delivered | 3.375 |
| Cement, Chicago consumers' net prices, without bags, f.o.b. | 2.05 |
| Gravel, ¾-in., cu.yd., delivered | 3.375 |
| Sand, cu.yd., delivered | 2.125 |

### Old Metals—New York and Chicago

| | |
|---|---|
| Heavy copper, cents per lb. | 13.375 |
| Light copper, cents per lb. | 11.625 |
| Heavy yellow brass, cents per lb. | 7.875 |
| Zinc, old scrap, cents per lb. | 3.375 |
| Lead, cents per lb. (heavy) | 5 125 |
| Steel car axles, Chicago, net ton | $15.75 |
| Cast iron car wheels, Chicago, gross ton | 14.50 |
| Rails (short), Chicago, gross ton | 17.50 |
| Rails (relaying), Chicago, gross ton (65 lb. and heavier) | 28.50 |
| Machine turnings, Chicago, gross ton | 8.25 |

## Encouraging Business Outlook

In the general business situation there is ample evidence to support the expectation of continued prosperity, according to the Guaranty Trust Company, New York City.

This evidence is not found in the mere fact of great industrial activity; for such a condition, while it certainly implies a large volume of aggregate purchasing power, may only be contributing to an unsound position in commodity markets, if the purchasing power is flowing into the wrong channels. The significant fact is that the high wage scales and the widely distributed income of the last few years apparently continue to operate as strongly as ever, so that active industrial operations are balanced by a ready movement of goods into the hands of consumers. The situation has been improved this year by further agricultural recovery, by a stronger position in certain industries that have been facing special difficulties, by a decline in unemployment, and by a continuance of economic progress in foreign countries.

## General Electric Dividends

The regular dividends of the General Electric Company were declared at a meeting of the board of directors of the company on Dec. 7, 1928, amounting to $1 per share on the common stock and 15 cents per share on the special stock, payable Jan. 25, 1929, to stockholders of record as of Dec. 19, 1928. In addition an extra dividened of $1 per share, payable on the same date, was declared on the common stock from the surplus of the company accumulated from the financing of time installment sales, which surplus had been set aside as a reserve as stated in the 1926 annual report and which amounted to upward of $5,000,000, and from the increase during the present year in income from investment and sources other than regular sales.

## English Electric Companies Merger

At recent meetings of the British Thomson-Houston Company and the Metropolitan-Vickers Electrical Company, it was stated that steps were being taken by these companies together with the Edison-Swan Electric Company and the Ferguson-Pailin Company which would lead to close co-operation, the elimination of unnecessary duplication of effort and expenditure, and the effecting of economies generally. The arrangements foreshadowed are now reported to be completed.

The Metropolitan-Vickers Company has acquired a large majority of the ordinary shares of the British Thomson-Houston, Edison-Swan, and Ferguson-Pailin Companies, and also a large majority of the preference shares of the last mentioned company. It is proposed to change the name of the Metropolitan-Vickers Company to make the title more comprehensive and the number of directors will be increased to include representatives of the various financial interests in the enterprise. H. C. Levis will be chairman and Sir Philip Nash managing director.

The majority of the shares will be owned by British holders. It is not intended that the activities of any of the four companies should be curtailed, but that they should actively co-operate under the general guidance of a central board. The business of the Metropolitan-Vickers Company will continue to be carried out by an existing subsidiary company, called the Metro-Vick Electrical Products.

## TRADE NOTES

MAX RUBENSTEIN has been transferred from the Philadelphia sales office of the Standard Underground Cable Company, Division of General Cable Corporation, to the general offices of the company in Pittsburgh where he will devote his time to the sales promotion of cable accessories.

CUTLER-HAMMER MANUFACTURING COMPANY, Milwaukee, Wis., has moved its Atlanta office into new quarters at 150 Peters Street, S.W., Atlanta, Ga. In addition to sales and engineering service on motor control apparatus and wiring devices, the new location provides warehouse facilities where many types of standard devices will be carried in stock for direct shipment to customers in that territory. A. C. Gibson is manager in charge of the Atlanta office.

BOTFIELD REFRACTORIES COMPANY, Philadelphia, Pa., announces that McCarthy-Jones & Allen Company, 111 First Avenue South, Nashville, Tenn., has been appointed distributor.

## ADVERTISING LITERATURE

ARMCO CULVERT MANUFACTURERS' ASSOCIATION, Middletown, Ohio, has issued bulletin No. H-34, entitled "Selecting Culverts and Drains on the Basis of Cost per Year." This bulletin includes comprehensive information on the purchase price, transportation from factory to site, cost of installation, maintenance and repairs in service, depreciation or cost of retirement, annual cost, and effect of durability on annual cost. The subjects discussed in this bulletin are supplemented with illustrations, drawings, detail tables and charts.

RUSSELL T. GRAY, Chicago, Ill., has issued bulletins Nos. 2 and 3 descriptive of Master equipment. Bulletin No. 2 is devoted mostly to various types of pliers. Bulletin No. 3 includes an illustrated description of a new method of handling high-voltage line maintenance and a complete description of Master tools and line equipment.

GENERAL ELECTRIC COMPANY, Schenectady, N. Y., has issued bulletin No. 249A, descriptive of GE-258 railway motor bearings; 61B, constant speed direct-current motors, type C.D.; 844A, across the line type of magnetic reversing switch for single-phase, two-phase and three-phase motors; 518A, type K-75 low, light-weight railway controller; and 746B, describing hinged type fingers for railway and industrial haulage controllers.



# More Power to you!

# Peacock Staffless Brakes

3000 lbs. of braking power. That's what the operator can apply and he doesn't have to be a modern Hercules to do it. But better still, he can apply this force with lightning speed. These brakes are noted for this feature, too.

And don't forget that Peacock Staffless never clogs. It has a tremendous appetite for chain. This is important when brake shoes are worn or rigging slack.

Strange to relate this piece of safety apparatus weighs very little—only 72 lbs. And it actually occupies less platform space than other types.

Yours for greater safety and bigger profits. More power to you!



## NATIONAL BRAKE COMPANY

890 Ellicott Square Buffalo, N. Y.

*Canadian Representative:* Lyman Tube & Supply Co., Ltd., Montreal, Can.
The Ellcon Co., *General Sales Representative:* 50 Church St., New York

# "*First Time*" Riders become *Regular Customers*



Seats 33 passengers. Seating layout optional. Note the standee well for rush loads. Roof hand rod extends to grab stanchion and entrance door. Wide windows mean more light. Ventilation complete. Comfortable heating.

LOOK at the air cushion seats—Bender seats. Passengers sit down and "let go"—*relax.*

That's what this Bender Body gives them—comfort. Comfort that resembles the restfulness of a floating easy chair.

First-time riders use this bus the next night, and the next, and the next. Permanent riders become more permanent friends. And business pushes ahead with the turning of the calendar.

THE BENDER BODY CO.
W. 62nd & Denison, Cleveland, O.




# BENDER BODIES

Specify Goodrich on your next Truck or Bus



# The big swing is to SILVERTOWNS!



WHEN old tires wear out, the replacements are—Silvertowns.

When new buses are ordered, the tire specifications call definitely for—Silvertowns.

Everywhere, in bus transportation, this is the outstanding story.

For cost records show, and performance proves, that the famous Water-Curing Process applied by Goodrich to Silvertowns revolutionizes tire service and dependability. By curing the rubber inside as well as out, Goodrich rules possible hidden weaknesses right out of Silvertown's makeup. This process double-toughens the rubber, seals the giant plies of stretch-matched cords against moisture and puts new strength and durability in tires.

Bus lines have seen these Water-Cured Silvertowns turn in record-smashing performances . . . and the word has gone round.

Give Silvertowns a ride . . . let them show what Water-Curing means, in economy, in mileage and in freedom from trouble.

THE B. F. GOODRICH RUBBER COMPANY
*Est. 1870* Akroo, Ohio. Pacific-Goodrich Rubber Company, Los Angeles, California. *In Canada:* Canadian-Goodrich Company, Kitchener, Ontario

# Goodrich
## HEAVY DUTY
# Silvertowns
HIGH PRESSURE OR BALLOON




# Cold weather requires *a fighting* gasoline

ZERO weather, wind and snow—a winter combination that tests to the limit the fuel you use in your buses. Gasoline to be dependable under such conditions, must possess to a high degree every feature essential to a good gasoline—quick starting in cold weather, proper arrangement of boiling point fractions assuring maximum development of power, economical mileage.

Red Crown Gasoline meets every one of these requirements. It is noted for its quick starting qualities. Low initial boiling point assures quick vaporization, so that the spark catches promptly.

Red Crown Gasoline is further characterized by the perfection of its chain of boiling point fractions, giving quick acceleration, maximum power and clean combustion. This is why Red Crown causes less dilution of oil in cold weather, why it gives more mileage per gallon.

If you would maintain your winter schedules; if you would reduce your winter operating expenses to the lowest possible point, Red Crown as a factor in accomplishing this surely deserves your consideration. Test it in one of your buses against any other fuel—prove to yourself that it is the most efficient and economical fuel—winter or summer.

STANDARD OIL COMPANY
(INDIANA)

*General Offices:* 910 South Michigan Avenue Chicago, Ill.

811

# A Nation-wide Service

## stands back of every National Fare Register



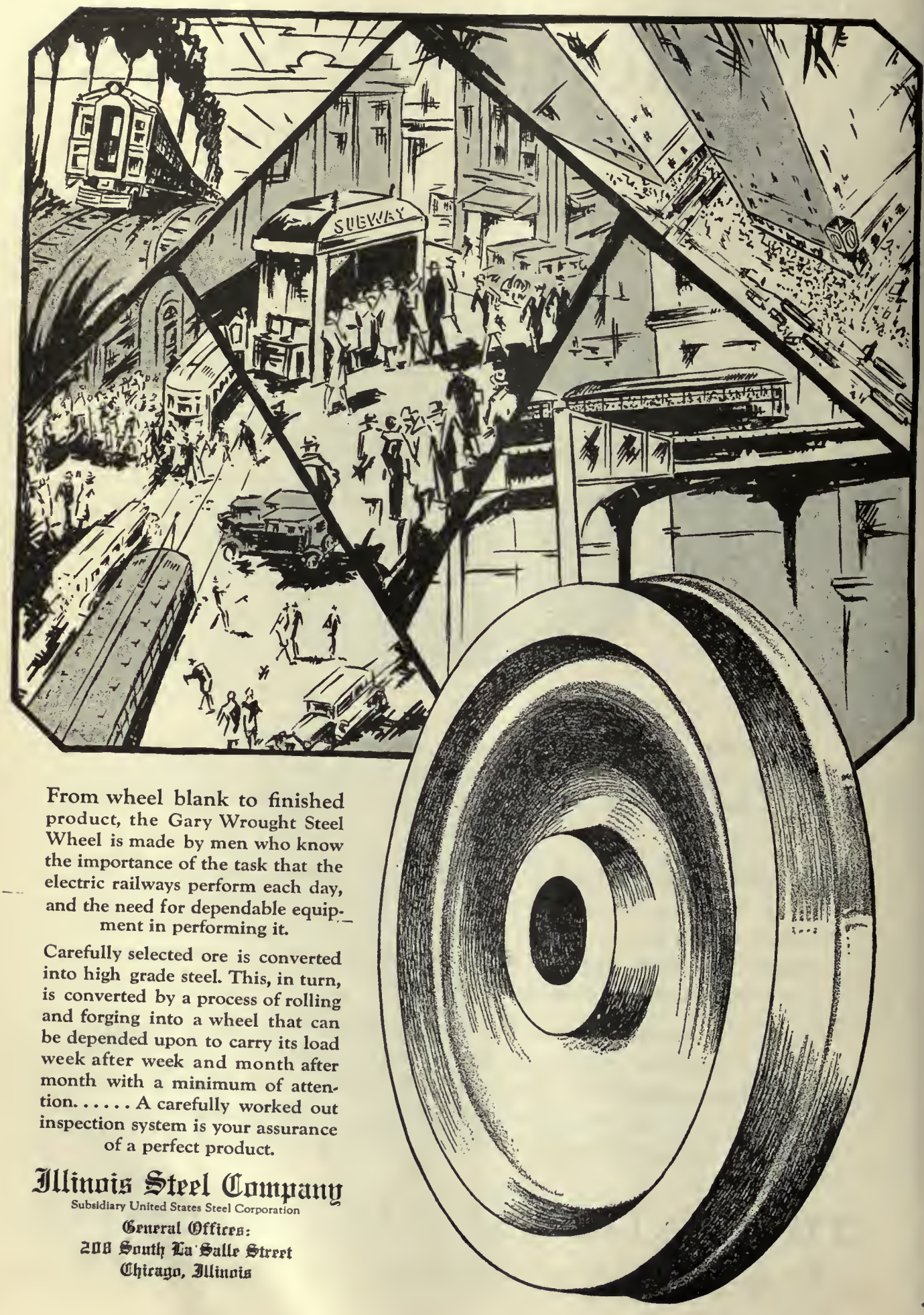

MORE than 400 service stations, dotting every section of the country, stand back of National Fare Registers. Frequently one interurban will run through three to four towns in which National Fare Register offices are located.

To interurban operators this guarantee of service is one of the most important considerations in selecting any kind of equipment. And although National Fare Registers require the minimum of service, and are built to withstand the roughest usage, service is always ready when needed.

The ten distinctive features of National Fare Registers plus nation-wide service, make this system superior to any that has ever been offered the interurban operator. Our representative in your city will be glad to tell you who is using this machine, what it has accomplished and what its advantages will be to you.

## THE NATIONAL FARE REGISTER

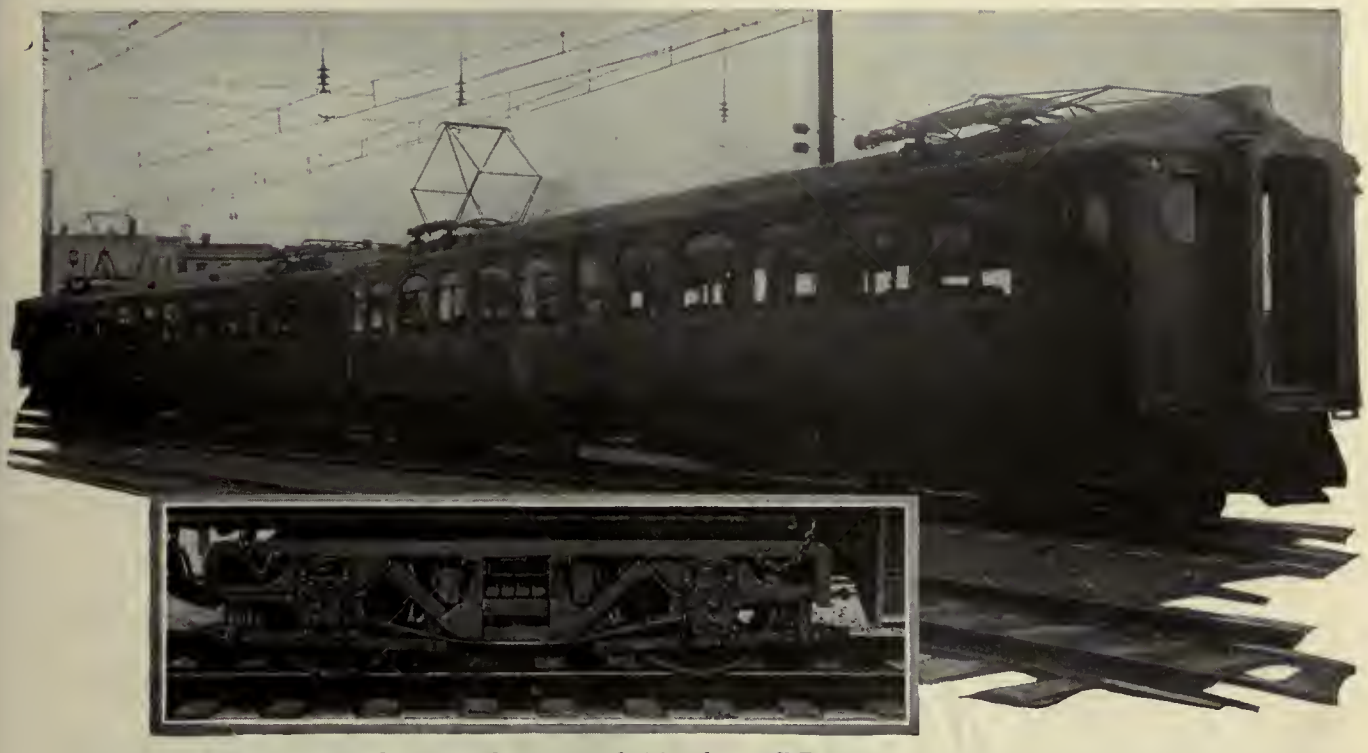
Product of The National Cash Register Company, Dayton, Ohio




From wheel blank to finished product, the Gary Wrought Steel Wheel is made by men who know the importance of the task that the electric railways perform each day, and the need for dependable equipment in performing it.

Carefully selected ore is converted into high grade steel. This, in turn, is converted by a process of rolling and forging into a wheel that can be depended upon to carry its load week after week and month after month with a minimum of attention. . . . . A carefully worked out inspection system is your assurance of a perfect product.

**Illinois Steel Company**
Subsidiary United States Steel Corporation
General Offices:
208 South La Salle Street
Chicago, Illinois



*A Hyatt equipped train on the New York, Westchester & Boston road. Closeup shows Hyatt Roller Bearing Journal Boxes as applied to Stilwell type of trucks used on these cars.*

# Another Hyatt User . . . REORDERS!

THE New York, Westchester & Boston Railway is one of more than sixty roads where Hyatt Roller Bearing Journal Boxes are in operation.

Last spring they equipped their first train with these efficient, time and power-saving bearings, and now have ordered additional Hyatt equipment . . . just as many other roads have done during the past year.

In our booklet, "What a Railroad Man Should Know About Anti-friction Journal Boxes," is contained the essence of Hyatt design and application. It explains concisely the advantages which are winning such overwhelming popularity for Hyatt Roller Bearings in railroad service.

If you do not have this brochure we will gladly send you a copy upon request.

HYATT ROLLER BEARING CO.
Newark Detroit Chicago Pittsburgh Oakland

HYATT
ROLLER BEARINGS
PRODUCT OF GENERAL MOTORS




# *Mutual Service*

TO the manufacturers and distributors of America and the street railway systems that transport the millions of America's potential buyers, Collier offers a mutual service.

This service has brought the street railway riders in thousands of cities and towns throughout the country to look upon car cards as extremely useful and pleasing features of up-to-date street car service. It has given national and local advertisers a medium thru which they can get their messages to selected territories easily, economically and convincingly.

Our business is one of service—service to the street railway industry, service to America's National and local advertisers, service to the millions of people who daily ride on street cars.




CANDLER BUILDING
NEW YORK, N. Y.



GENERAL pioneered the truck and bus tire market and in supplying the big part of that market General has gained the broadest experience. This experience is a part of every General dealer's service—knowing how to tackle the toughest jobs and properly fit the right tire to the job. This knowledge is a big factor in reducing operating costs and delivering the longest uninterrupted mileage.

THE GENERAL TIRE AND RUBBER COMPANY, AKRON, OHIO



The Mark of Leading Tire Stores Everywhere

*The Heavy Express Special*

Specially built to stand up under the load at express speed, the Heavy Express Special carries through on any job. Operators everywhere are swinging to it.

*The*

# GENERAL

## TIRE

*—goes a long way to make friends*

# Heralding a year of activity and progress

## *The* ANNUAL STATISTICAL ISSUE

of

## Electric Railway Journal

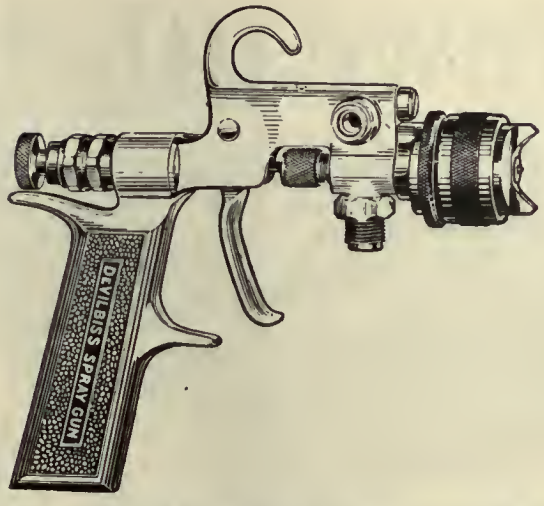
## *January 12, 1929*

This important issue is being awaited with even greater interest than usual. It will chronicle the achievements of a year that has seen encouraging progress. And it will forecast an increasingly optimistic picture for 1929.

The contents of the issue will include the basic statistics for 1928; a complete picture of the Industry's budgets for 1929; high spots of the year's progress in financing, construction, operation and maintenance, and a review of the advances made by manufacturers.

The advertising pages will, as usual, form an important new year exhibit of the latest in equipment, materials and supplies.

## Advertising forms close JANUARY 2nd




# LEADERSHIP

## *of varied and comprehensive experience*

DEVILBISS meets the finish maintenance problem of the electric railway operator with equipment which embodies twenty years of experience in developing spray-finishing methods and equipment for use in all groups and industries having finish-maintenance problems.

The electric railway can adopt this modern time and labor-saving method and DeVilbiss equipment without feeling that it is an experiment in any sense. Today DeVilbiss offers to the electric railway spray equipment of established practicability and value. Complete DeVilbiss equipment or any part of it, spray guns and accessories, exhausting devices, air compressors, even DeVilbiss hose and connections are, the perfected and ultra-refined products which have revealed the most merit under numerous and diverse conditions of use.

There are many other good reasons why you should employ DeVilbiss spray equipment. We will gladly give you counsel and information bearing upon your own particular operation and the equipment best prepared to meet your individual painting and finishing problems.

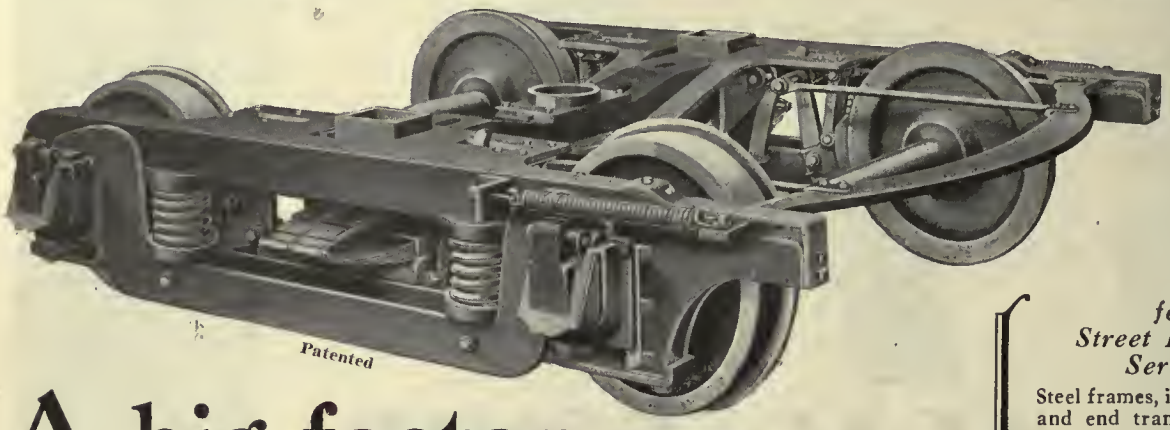
THE DEVILBISS COMPANY
272 PHILLIPS AVENUE TOLEDO, OHIO

Sales and Service Branches:
New York Philadelphia Cleveland Detroit Indianapolis
Chicago St. Louis San Francisco Windsor, Ontario
Direct factory representatives in all other territories

# DeVilbiss
## Spray-PAINTING FINISHING System

DOES THE WORK OF FIVE MEN

# Commonwealth Trucks




## A big factor *in economical operation*

*for Street Railway Service*

Steel frames, including cross and end transoms, cast in one strong unit.

Pedestals cast integral with frame are machined and protected from wear by renewable, hardened spring steel lines.

The design, material, and workmanship of Commonwealth Trucks are all the fruit of mature engineering experience. They combine to make a simple, rugged truck that gives years of service without maintenance cost. That's why so many leading railways have adopted them as standard.

COMMONWEALTH STEEL COMPANY
Granite City, Illinois

# AMERICAN BRIDGE COMPANY

71 Broadway, New York



*Highway Bridge across Russian River at Guerneville, Cal.*

*Manufacturers of Steel Structures of all classes, particularly*

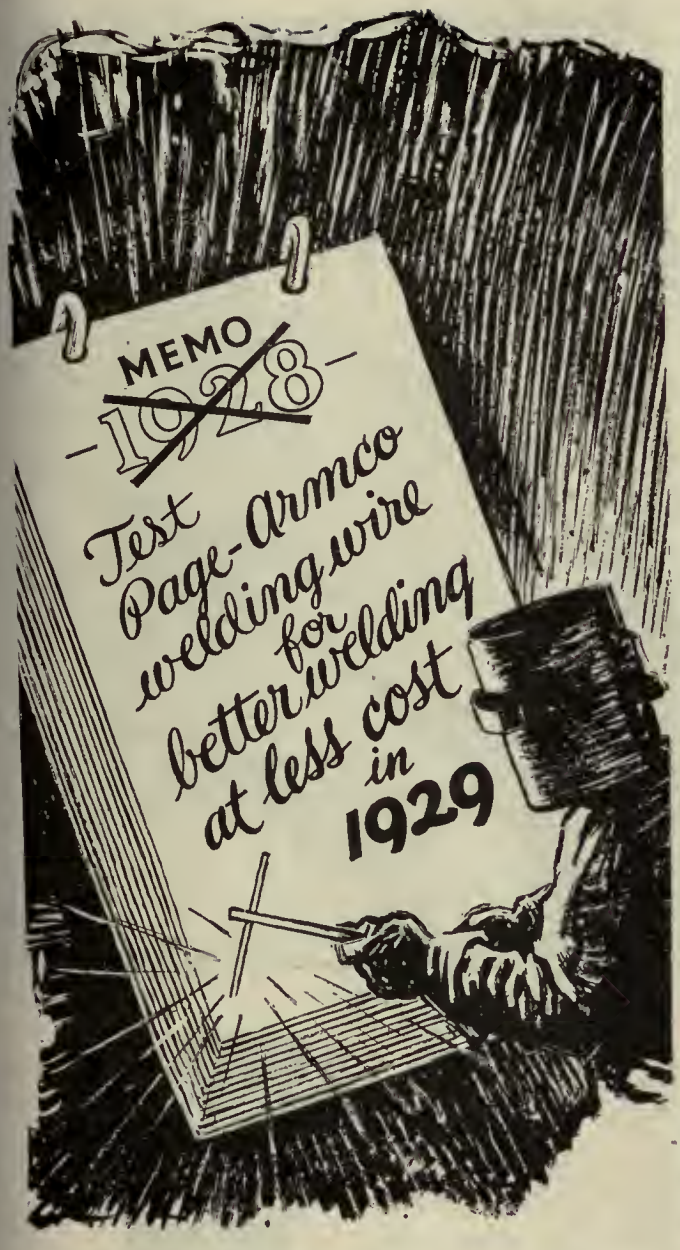
## BRIDGES AND BUILDINGS

HIGHWAY BRIDGES

POWER HOUSES — BOILER HOUSES

ROOF TRUSSES — COLUMNS, GIRDERS

*Offices in Principal Cities*




Now—while you are making plans for better welding at lower costs in 1929, it will pay you to investigate Page-Armco Welding Wire and Electrodes.

A careful test will show you that this carefully processed, flame-tested and shop-tested wire gives better welding results at less cost. There is a grade for every need—each plainly marked for easy identification.

Write for test sample and complete information—TODAY.

PAGE STEEL *and* WIRE COMPANY
BRIDGEPORT, CONNECTICUT
*District Offices:*
Chicago New York Pittsburgh
San Francisco
An Associate Company of the American Chain Company, Inc.,
Bridgeport, Connecticut
*In Canada:* Frost Steel and Wire Co., Hamilton, Ontario

# PAGE-ARMCO
Flame-Tested PROCESSED Shop-Tested
# Welding Wire and Electrodes



# MUCKEE

When the Nuer parks himself for the night he digs a hole and literally pulls the hole in after him.

By this means he protects himself against the muckee (insects).

Thus he makes a hard job of the simple act of going to bed.

"Mosquito netting!"—suggests someone as a simpler method.

Clever idea, but you can't change some people's customs very readily. For years we've been telling operators of electric machines that Morganite brushes take all the work out of getting good commutation, yet every so often you'll find an operator tussling with grooved commutators, lubricants and all the byproducts and accessories of misapplied carbon brushes.

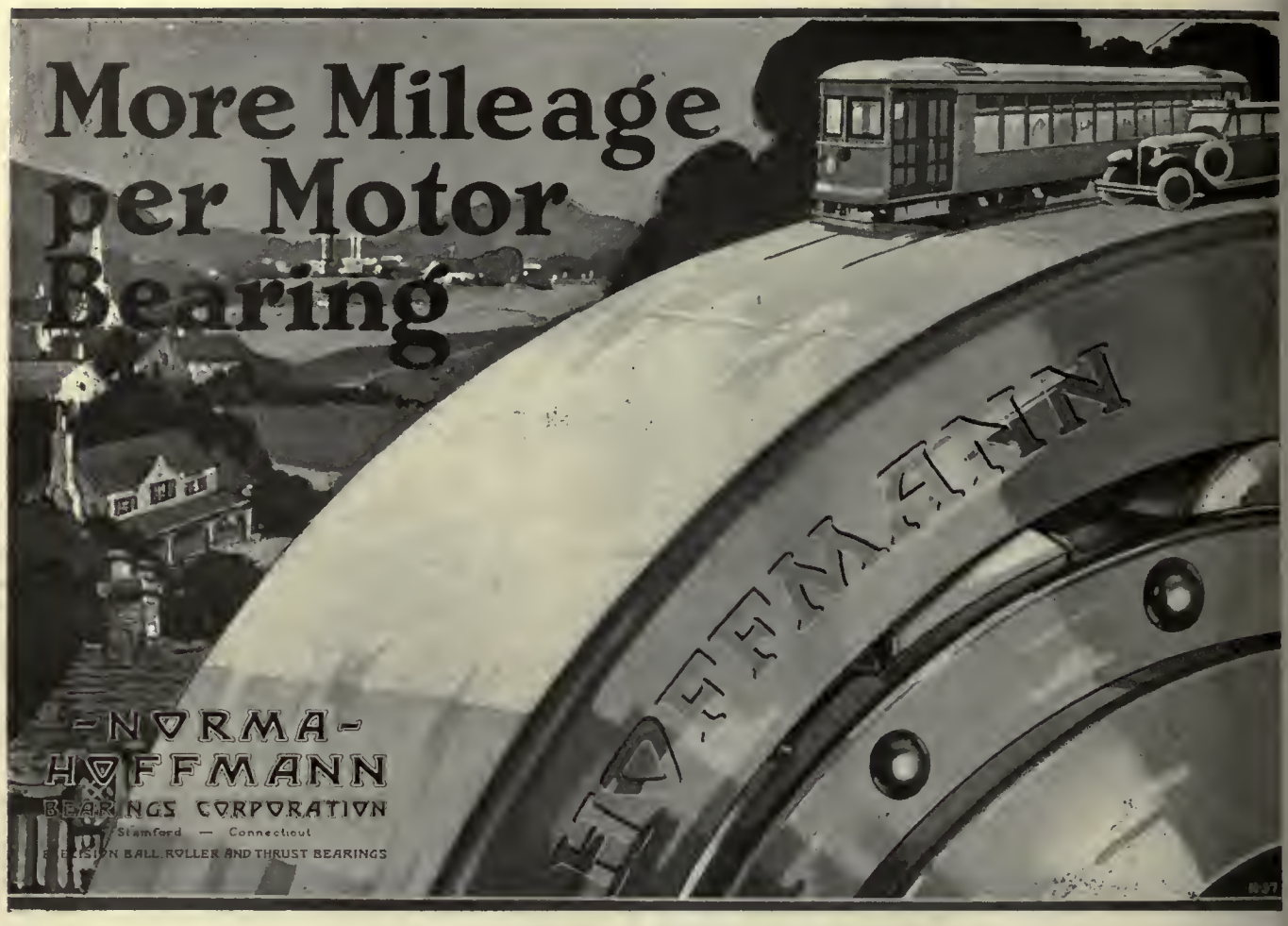
Otherwise we find it a pretty good world after all.

# Morganite Brush Co., Inc.

*Main Office and Factory*
*3302-3320 Anable Ave., Long Island City, N. Y.*

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***Cleveland,*** Electrical Engineering & Mfg. Co., 320 Union Building.
***Baltimore,*** O. T. Hall, Sales Engineer, 432 North Calvert St.
***Revere, Mass.,*** J. F. Drummey, 78 Pleasant Street.
***Los Angeles,*** Electrical Engineering Sales Co., 802 Delta Bldg.
***San Francisco,*** Electrical Engineering Sales Co., 222 Underwood Bldg.
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***Montreal, Can.,*** Railway & Power Engineering Corp., Ltd., St. Antoine St.
***Winnipeg, Can.,*** Railway & Power Engineering Corp., Ltd., P. O. Box 328.




# For Safety's Sake

- Brake Pins
- Brake Hangers
- Brake Levers
- Pedestal Gibs
- Brake Fulcrums
- Center Bearings
- Side Bearings
- Spring Post Bushings
- Brake Bushings
- Bronze Bearings
- Bolster and Transom Chafing Plates
- Spring Posts
- McArthur Turnbuckles
- Manganese Brake Heads
- Manganese Truck Parts

Defective parts have often been the cause of accidents in electric railway operation. Perhaps a worn brake pin, a faulty bearing or loose turnbuckle. For safety's sake it pays to get the very best small parts for these important jobs.

Boyerized Parts are the best guarantee of safe performance you can buy. Made of the finest steel, carefully heat treated, and properly designed, they naturally cost a little more than other makes. But they are worth it. That is why it pays to specify them and insist on getting them.

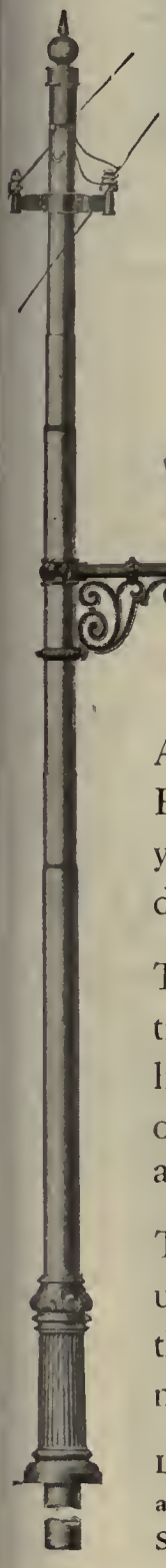


BEMIS CAR TRUCK COMPANY
SPRINGFIELD, MASS.

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# BOYERIZED PARTS

# EVERYTHING



## That a Good Trolley Pole Should Have



APPEARANCE, strength, durability, adaptability, economy—is embodied in Elreco Tubular Steel Poles.

Appearance is self evident. Perfect condition after 35 years of service establishes durability and strength.

The ability to carry span, trolley and lighting wires, lighting units, traffic signals on one pole evidences adaptability.

Three or four companies utilizing the same pole cuts the individual cost and manifests economy.

Let us show you why hundreds of cities and towns have selected Elreco Tubular Steel Poles. *Write—*

**The Electric Railway Equipment Company**

2900 Cormany Ave.
Cincinnati, Ohio

30 Church St.
New York City



VIZABLEDG
PATENTED
# SAFKAR
TRADE MARK REG
SAFSTEP

Winter's icy storms bring no added hazard to the car equipped with **"Safkar"** Steps. Snow, ice or sleet will not make their surface slippery—snow will not build up in and on them. Not only are step accidents reduced, but traffic is speeded up because passengers feel the secure **"Safkar"** foot hold.

*Write for Bulletin D28.*

**IRVING IRON WORKS CO.**
LONG ISLAND CITY, N.Y. U.S.A.
Established in 1902
SALES OFFICES IN ALL PRINCIPAL CITIES
See Your Telephone Book for Local Address

# LORAIN

Girder Rails, Special Trackwork, Switches, Frogs and Crossings in Solid Manganese Steel, Manganese Insert Construction, Chrome Nickel Steel Insert Construction and Built-up Construction of all heights and weights of rail

## The Lorain Steel Company

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

General Offices: Johnstown, Pennsylvania

*Sales Offices:*

Atlanta Chicago Cleveland Dallas New York Philadelphia Pittsburgh

Pacific Coast Representatives: U. S. Steel Products Co., San Francisco, Seattle, Portland, Los Angeles
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## COLUMBIA

Railway and Utility Supplies

Castings—Grey Iron, Brass and Aluminum

Forgings
Special Machinery and Patterns

Machine and Sheet Metal Work

Armature and Field Coils.

*The* Columbia Machine Works *and M. I. Co.*
265 Chestnut St., corner Atlantic Ave.,
Brooklyn, New York

## A HOME RUN in Concrete Breakers

The New Sullivan Buster Is Ready



Here's the new "K-3" Buster —ready to make money for you.

"K-3" was designed especially in speed and blow for removing concrete. It cuts concrete much faster—yet uses less air than previous models.

"K-3" is powerful, rugged, but easy to handle. With its push throttle control you hold it against the work and it goes; release the pressure and it stops.

"K-3" is built on straight lines with no projections to interfere with the operator. Let us put one on trial on your job.

Send for the Catalog, 3281-U

SULLIVAN MACHINERY COMPANY
150 S. MICHIGAN AVE., CHICAGO

SULLIVAN

## Griffin Wheel Company

410 North Michigan Ave.
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# Griffin Wheels

with
Chilled Rims
and
Chilled Back of Flanges
For Street and Interurban Railways

FOUNDRIES:

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PERFECT MICANITE INSULATOR REG. U.S. PAT. OFF. and PERFECT EMPIRE INSULATOR REG. U.S. PAT. OFF.

Micanite and Super-Micanite Sheets, Commutator Segments, and Commutator Rings

Micanite Tubes and Washers

Linotape, Seamless or Sewn Bias
*(Yellow or Black Varnished Tapes)*

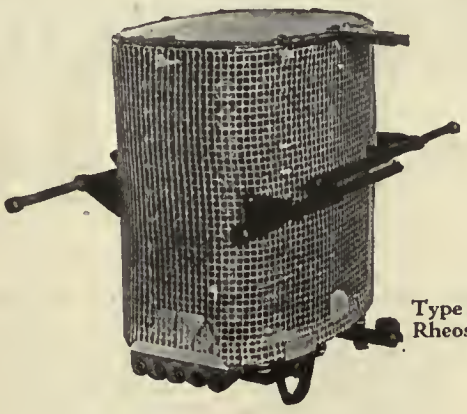
Empire Oiled Cloths and Papers
*(Yellow or Black)*

Compounds, Varnishes Etc.

*Send for catalog and helpful booklet on Commutator Insulation and Assembly*

MICA INSULATOR COMPANY
*Largest manufacturers in the world of mica insulation.*
*Established 1893.*

New York: 200 Varick St. Chicago: 542 So. Dearborn St.
Cleveland Pittsburgh Cincinnati Seattle
San Francisco Toronto Montreal Los Angeles
*Works: Schenectady, New York. London, England*



Type SR Rheostat

## ERICO Type SR Portable Welding Outfit *is*

**Easy to Weld with**

Five current taps provide proper welding currents at all conditions of power from half to full line voltage. All connecting leads are made from flexible rubber covered cable.

**Easy to Handle**

Light weight—only 150 lbs.—and compact design assure easy transportation of the rheostat. The carrying handles slide in beside the rheostat when not in use. For extended bonding or welding a light weight, easy running Larry can be furnished.

**No trouble to Maintain**

Type SR Rheostat is a rugged brute—the frame is made of specially formed channels of great strength. The resistance wire coil is of practically indestructible heavy wire. The wire is insulated from the frame and the frame is itself insulated from the ground by means of pure mica washers. All parts are given a rust proof finish which will withstand practically any climatic condition.

*Ask for Circular 17*



The Electric Railway Improvement Co.
2070 E. 61 Place Cleveland, Ohio

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Incorporated
**Engineers**
39 Broadway, New York
PHILADELPHIA CHICAGO SAN FRANCISCO

## The J. G. White Engineering Corporation
Engineers — Constructors
Steam and Hydro-Electric Power Plants, Gas Plants, Steam and Electric Railroads, Transmission Systems, Buildings and Industrial Plants.
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*Railway and Highway Consulting Engineers*
An organization of experienced engineers, prepared to assist you in the installation of highway operations as a substitute for or a supplement to your rail operations.
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ENGINEERING AND CONSTRUCTION
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68 TRINITY PLACE NEW YORK

# What is the answer?

The accuracy of the answer to your transportation problem depends upon experience and intimate knowledge concerning all phases of transportation, coupled with a common-sense viewpoint.

You will find these qualifications developed to a marked degree within the ranks of experienced engineering service — particularly when such service is highly personalized.

W H Sawyer
PRESIDENT

STEVENS & WOOD, Incorporated
*Engineers and Constructors*
20 Pine Street, New York
Chicago - Youngstown, Ohio

*A Personalized Service*

THE WORLD'S STANDARD
**"IRVINGTON"**
Black Varnished Silk, and Varnished Cambric, Yellow Varnished Paper
Irv-O-Slot Insulation Flexible Varnished Tubing
Insulating Varnishes and Compounds
Irvington Varnish & Insulator Co.
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A. L. Gillies, Toronto — Martin Woodard, Seattle
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**Johnson Electric Fare Boxes**



and overhead registers make possible the instantaneous registering and counting of every fare. Revenues are increased 1½ to 5% and the efficiency of one-man operation is materially increased. Over 5000 already in use.
**Johnson Fare Box Co.**
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THE P. EDWARD WISH SERVICE
50 Church St. NEW YORK — *Street Railway Inspection* DETECTIVES — 131 State St. BOSTON

When writing the advertiser for information or prices, a mention of the Electric Railway Journal would be appreciated.

*The* DIFFERENTIAL CAR



*Standard on 60 Railways for*
Track Maintenance
Track Construction
Ash Disposal
Coal Hauling
Concrete Materials
Waste Handling
Excavated Materials
Hauling Cross Ties
Snow Disposal
*Use These Labor Savers*
Differential Crane Car
Clark Concrete Breaker
Differential 3-way Auto Truck Body
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THE DIFFERENTIAL STEEL CAR CO., Findlay, O.



*Gets Every Fare*
PEREY TURNSTILES or PASSIMETERS
Use them in your Prepayment Areas and Street Cars
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UNA
RAIL JOINTS
DYNAMOTORS
WELDING ROD
UNA Welding & Bonding Co.
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BELL
NORTHERN — WESTERN
CEDAR POLES
BUTT TREATING ALL GRADES — TIES
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ELECTRIC HEATERS WITH OPEN COIL OR ENCLOSED ELEMENTS
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Better Quality Seats For Cars and Buses
Hale & Kilburn Co.
1800 Lehigh Ave., Philadelphia, Pa.



## Complete satisfaction

Operating perfectly and requiring minimum attention for maintenance and lubrication, Earll Catchers and Retrievers give genuinely satisfactory results. Their refinement of design, and mechanical superiority are summarized in the following five features, peculiar to Earll construction.

**No-wear Check Pawl**
**Free-Winding Tension Spring**
**Ratchet Wind**
**Emergency Release**
**Perfect Automatic Lubrication**

Earll Catchers and Retrievers

C. I. EARLL, York, Pa.

*Canadian Agents:*
Railway & Power Engineering Corp., Ltd., Toronto, Ont.
*In All Other Foreign Countries:*
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TRUCK WITH TOWER IN RUNNING POSITION

# TRENTON TOWER

## This 3-Section

is not only more convenient, but stronger than the older type.

The top section is reinforced by the intermediate section. The 3-section design makes it possible to raise the platform 16 inches higher and drop it 12 inches lower than can be done with the old-style 2-section tower.

We'll gladly send you details.

## J. R. McCARDELL CO.

Trenton, New Jersey, U. S. A.




## Drip Points for Added Efficiency

They prevent creeping moisture and quickly drain the petticoat in wet weather, keeping the inner area dry.

The Above Insulator—No. 72—Voltages—Test—Dry 64,000 Wet 31,400, Line 10,000.

Our engineers are always ready to help you on your glass insulator problem. Write for catalog.

Hemingray Glass Company
Muncie, Ind.
Est. 1848—Inc. 1870



## Check

Car movements at time points with Nachod Automatic Headway Recorders. The cars mark their own time on the chart — an easily readable record, easily filed for reference.

The chart shows whether the car is early or late, points out irregularities in the schedule. The careful manager has a complete and accurate record.

Automatic Block Signals and Highway Crossing Signals

to meet every operating requirement. We shall gladly submit recommendations for complete systems.

Nachod Spells Safety

*Send for catalogs.*

Nachod & United States Signal Co., Inc.
4777 Louisville Ave., Louisville, Kentucky

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UNDISPLAYED—RATE PER WORD:

*Positions Wanted*, 4 cents a word, minimum 75 cents an insertion, payable in advance.

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INFORMATION:

*Box Numbers* in care of any of our offices count 10 words additional in undisplayed ads.

*Discount* of 10% if one payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

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1 to 3 inches.....$4.50 an inch
4 to 7 inches..... 4.30 an inch
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Rates for larger spaces, or yearly rates, on request.

*An advertising inch* is measured vertically on one column, 3 columns—30 inches—to a page.

R.J.

## POSITION VACANT

WANTED — Young man as assistant superintendent of transportation for an Eastern city of 70,000 population, operating 60 street cars and 30 buses. Should be thoroughly experienced in schedule making and in all matters relating to scientific transportation. Please give experience and salary desired. P-150, Electric Railway Journal, Tenth Ave. at 36th Street, New York.

## POSITIONS WANTED

GENERAL executive, fifteen years' successful experience, construction, maintenance, operation, management; seeks connection with a future. PW-147, Electric Railway Journal, Tenth Ave. at 36th St., New York.

STREET railway superintendent, also bus operator, will be open for employment about January first. Experienced in disposing of street railway equipment and installing buses. Speaks Spanish; is electrical and mechanical engineer. Can go anywhere. PW-148, Electric Railway Journal, Tenth Ave. at 36th St., New York.

SUPERINTENDENT transportation, with broad experience, clean, successful record, high-grade references, available short notice; would consider position of assistant superintendent with a future; can arrange for personal interview; correspondence invited. PW-149, Electric Railway Journal, 1600 Arch St., Philadelphia, Pa.

Watch the
SEARCHLIGHT SECTION
for Equipment-Opportunities

## OFFICIAL PROPOSALS

Bids: Dec. 19.

### Furnishing and Delivering Cars and Equipment

New York, N. Y.

Notice is hereby given that a public hearing will be held at the office of the Board of Transportation of The City of New York, at No. 49 Lafayette Street, Borough of Manhattan, on the 19th day of December, 1928, at 11:30 a.m., on the proposed terms and conditions of the draft form of contract for furnishing and delivering cars and car equipment complete, except for motors, for New York City's new subway system.

Copies of said draft of proposed contract may be obtained at the office of the Board of Transportation at one dollar each.

JOHN H. DELANEY, Chairman.
FRANCIS J. SINNOTT, Secretary.
November 27, 1928.

Bids: Dec. 18.

### Furnishing and Installing Signal Equipment, Etc.

New York, N. Y.

Notice is hereby given that a public hearing will be held at the office of the Board of Transportation of The City of New York, at No. 49 Lafayette Street, Borough of Manhattan, on the 18th day of December, 1928, at 11:30 a.m., on the proposed terms and conditions of the draft form of contract for furnishing and installing signal and interlocking equipment on New York City's new subway system along and under Central Park West, Eighth Avenue, St. Nicholas Avenue, Broadway, Fort Washington Avenue and Broadway, and 207th Street, from 68th Street to and including the 207th Street Yard at the Harlem River, in the Borough of Manhattan, City of New York.

Copies of said draft of proposed contract may be obtained at the office of the Board of Transportation at one dollar each.

JOHN H. DELANEY, Chairman.
FRANCIS J. SINNOTT, Secretary.
November 27, 1928.


**We have just purchased the Hudson Valley Traction Trolley line and have the following machinery in perfect condition:**

5—Rotary Converters, 300 kw.
12—Transformers, 110 kw.
9—Rotary Converters, 375 kw.
21—Transformers, 150 kw.
Also 3000 tons 80 lb. rail.
1000 tons 70 lb. rail.
1500 tons 60 lb. rail.

***In first class relaying condition. Wire for prices.***

M. K. FRANK
Union Trust Bldg., Pittsburgh, Pa.
Park Row Bldg., New York City

FOR SALE
**5 BIRNEY CARS**
Less than three years old. 70,000 miles, double end, single truck, excellent condition, G. E. equipped pneumatic operated doors, 32 passengers, built on Brill Co.'s Miami specifications. Details furnished on request.
CITY COMMISSION, Coral Gables, Fla.

WANTED TO BUY
8 to 12
Light Weight Double Truck
CARS
AT ONCE
*Send full particulars and price to*
W-151, Electric Railway Journal
Tenth Ave. at 36th St., New York City

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JOBS and MEN—For Shop and Office: Technical, Executive, Operative and Selling: *See "SEARCHLIGHT"*

# Equipment "Opportunities"

TO BUY, SELL, RENT and EXCHANGE—Used and Surplus New Equipment and Material—*See "SEARCHLIGHT"*

# Business "Opportunities"

OFFERED and WANTED—Capital, Plants, Properties, Franchises, Auctions —*See "SEARCHLIGHT"*

***For "Opportunities" of every kind: "Think SEARCHLIGHT First!"***

0103

# WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors Advertising in this Issue

This index is published as a convenience to the reader. Every care is taken to make it accurate, but *Electric Railway Journal* assumes no responsibility for errors or omissions.

**Advertising, Street Car**
Collier Inc., Barron G.

**Air Brakes**
General Electric Co.
Westinghouse Air Brake Co.

**Anchors, Guy**
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

**Armature Shop Tools**
Columbia Machine Wks.
Elec. Service Supplies Co.

**Automatic Return Switch Stands**
Ramapo Ajax Corp.

**Automatic Safety Switch Stands**
Ramapo Ajax Corp.

**Axles**
Bemis Car Truck Co.
Bethlehem Steel Co.
Brill Co., The J. G.
Cincinnati Car Co.
Illinois Steel Co.
Standard Steel Works Co.
Westinghouse E. & M. Co.

**Axles, Steel**
Bethlehem Steel Co.

**Babbit Metal**
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**Badges and Buttons**
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**Barges, Steel**
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**Batteries, Dry**
Nichols-Lintern Co.

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**Bearings, Ball**
Norma-Hoffman Bear. Corp.

**Bearings and Bearing Metals**
Bemis Car Truck Co.
Cincinnati Car Co.
Columbia Machine Wks.
Nat'l Bearing Metals Corp.
Westinghouse E. & M. Co.

**Bearings, Center and Roller Side**
Cincinnati Car Co.
Stucki Co., A.

**Bearings, Roller**
Hyatt Roller Bearing Co.
Norma-Hoffman Bear. Corp.
Timken Roller Bearing Co.

**Bearings, Thrust**
Timken Roller Bearing Co.

**Bells & Buzzers**
Consolidated Car Heating Co.

**Bells and Gongs**
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Wks.
Elec. Service Supplies Co.

**Benders, Rail**
Railway Trackwork Co.

**Bodies, Bus**
Bender Body Co.
Brill Co., The J. G.

**Bolts & Nuts, Track**
Illinois Steel Co.

**Bolts, Case Hardened**
American Steel Foundries
Bemis Car Truck Co.

**Bond Testers**
American Steel & Wire Co.
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**Bonding Apparatus**
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Elect. Railway Improve. Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.

**Bonds, Rail**
American Steel & Wire Co.
Elect. Railway Improve. Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Page Steel & Wire Co.
Railway Trackwork Co.
Una Welding & Bonding Co.
Westinghouse E. & M. Co.

**Brackets and Cross Arms (See also Poles, Ties, Posts, etc.)**
American Bridge Co.
Columbia Machine Wks.
Electric Rlwy. Equip. Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.

**Brake Adjusters**
American Steel Foundries
Brill Co., The J. G.
Cincinnati Car Co.
Nat'l Rlwy. Appliance Co.
Westinghouse Tr. Brake Co.

**Brake Shoes**
Bemis Car Truck Co.
Brill Co., The J. G.

**Brake Testers**
Nat'l. Rlwy. Appliance Co.

**Brakes, Brake Systems and Brake Parts**
American Steel Foundries
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Wks.
General Electric Co.
National Brake Co.
Westinghouse Tr. Brake Co.

**Brakes, Magnetic Rail**
Cincinnati Car Co.

**Bridges, Steel**
American Bridge Co.

**Brushes, Carbon**
General Electric Co.
Morganite Brush Co., Inc.
Westinghouse E. & M. Co.

**Brushes, Graphite**
Morganite Brush Co., Inc.

**Brushholders**
Columbia Machine Wks.
General Electric Co.

**Buildings, Steel**
American Bridge Co.

**Bunkers, Coal**
American Bridge Co.

**Bus Lighting**
Nat'l Railway Appliance Co.

**Buses, Gas, Electric**
General Electric Co.

**Bushings, Case Hardened and Manganese**
American Steel Foundries
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Wks

**Cables (See Wires and Cables)**

**Cambric Tapes, Yellow and Black Varnished**
General Electric Co.
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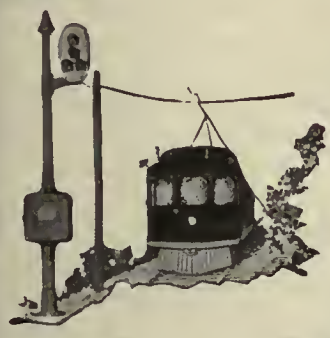
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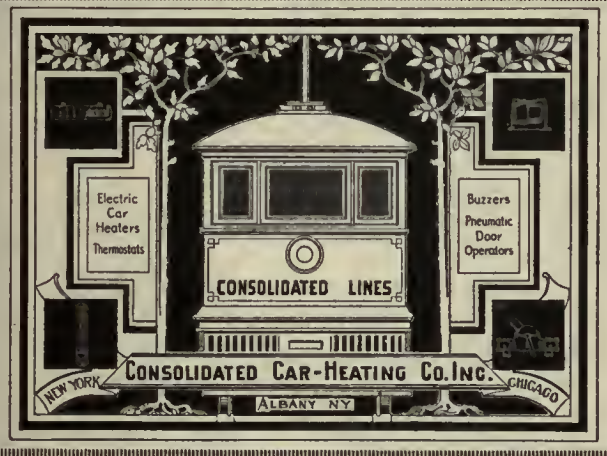
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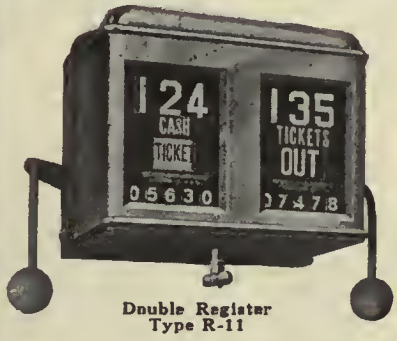
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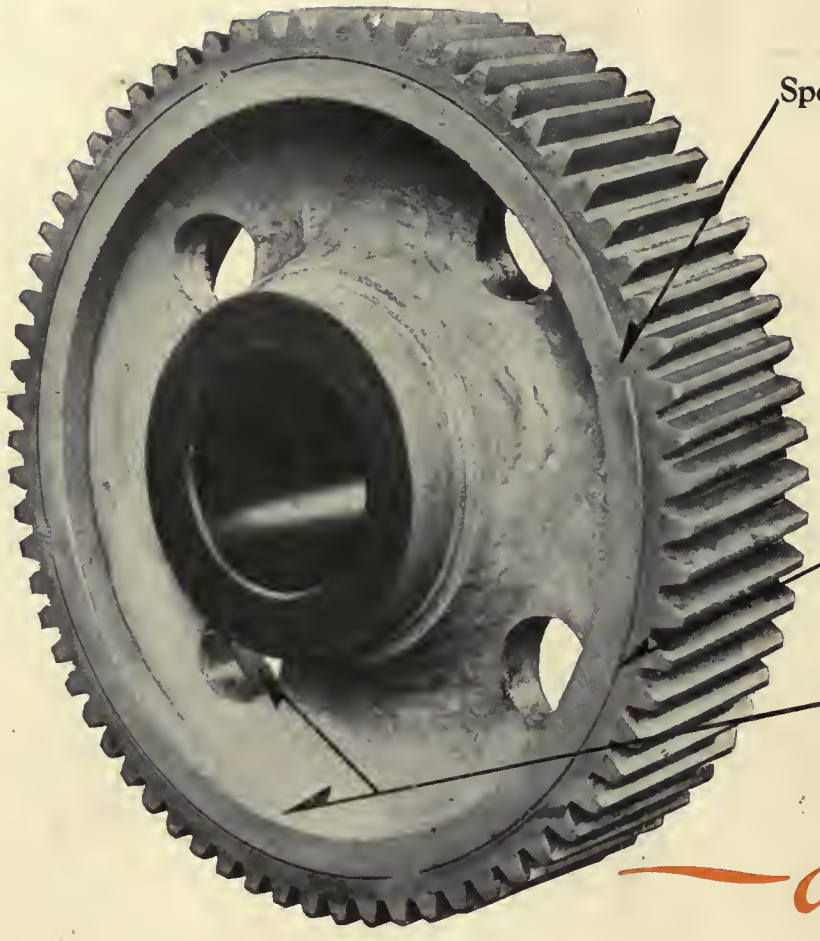



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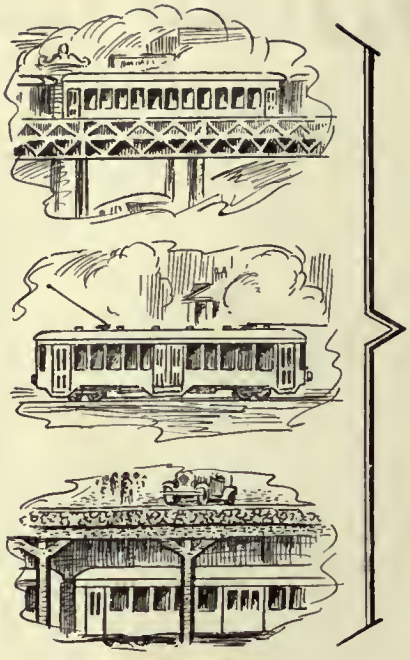
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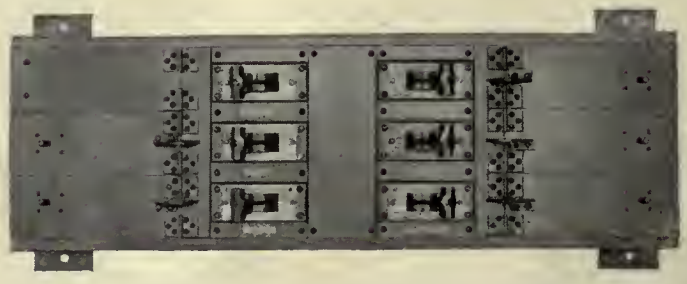
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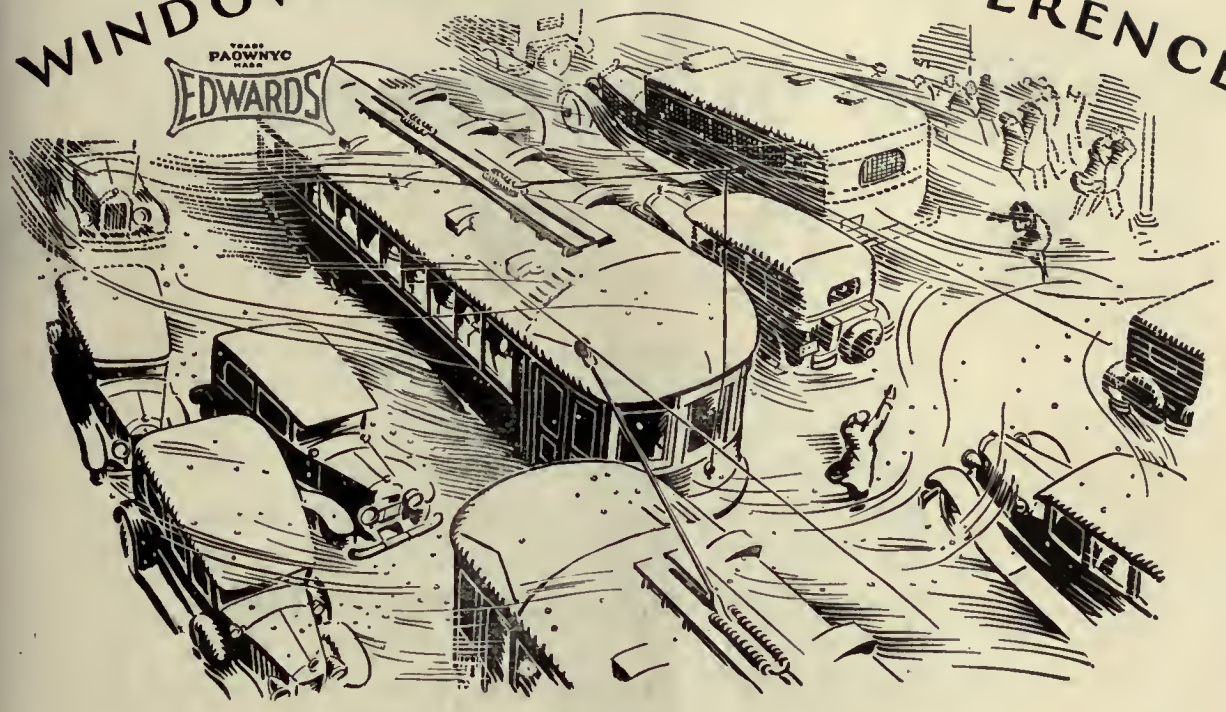
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Edwards Metal Sash means passenger comfort because of air-tight, silent, smooth sliding windows. And it means maintenance costs that are reduced to a minimum.

Specify Edwards Metal Sash for your cars and motor coaches. It pays its own way.

*Our catalog and complete information on Edwards Metal Sash should be in your files. Send for it.*

O. M. EDWARDS CO.
New York Syracuse, N. Y. Chicago
*Canadian Representatives:*
LYMAN TUBE & SUPPLY CO., LTD.
Montreal and Toronto

# Edwards Metal Sash

# The sign of success

# G R O W T H

WHILE the long experience we have had in the carbon industry is significant to the users of carbon products, it is not the only guide for them to follow. History lends prestige to an institution, and age is an asset. But there are many old companies that are no larger than they were when they started—they did not grow.

Growth is an evidence of success. We have grown steadily since the pioneering days of the carbon industry, and we are still growing. Our growth has been due to the ability to supply quality products, to meet modern requirements, and to use our experience in giving our customers an ever higher type of service.




NATIONAL CARBON COMPANY, INC.

*Unit of Union Carbide* UCC *and Carbon Corporation*

*Carbon Sales Division*

Cleveland, Ohio — SILVER STRAND CABLE TRADE MARK REGISTERED — San Francisco, Cal.

*Branch Offices and Factories*

CHICAGO, ILL. PITTSBURGH, PA. JERSEY CITY, N. J. BIRMINGHAM, ALA.




ELECTRIC SERVICE SUPPLIES CO.
MANUFACTURER OF RAILWAY, POWER AND INDUSTRIAL ELECTRICAL MATERIAL



One of the cars to which Simplex Clasp Brakes have been applied

# SIMPLEX MULTIPLE UNIT CLASP BRAKES

Railroads would not purchase passenger cars without "Simplex Clasp Brakes."

Why not specify "Simplex Multiple Unit Motor and Trailer Truck Clasp Brakes" for Gas — Electric and Electric Cars.

Send us your inquiries for information and designs.

The mechanically correct Brake for a Modern Car.

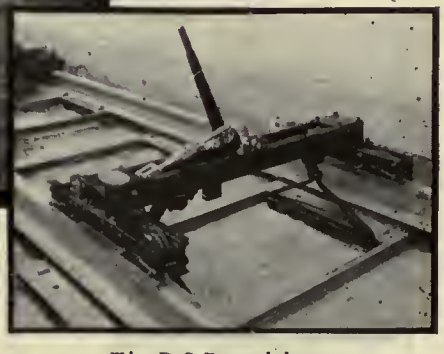
**AMERICAN STEEL FOUNDRIES**

NEW YORK CHICAGO ST. LOUIS

# More Dependable Track Construction .... with LESS Men!



*Compression tamper at work on Second St., Cuyahoga Falls, Ohio*



*The D-S-R track layer*

THE reduction of men required with International machine methods and Steel Twin Ties is worthy of careful comparison with existing methods of track construction. But a result of compression tamping *beyond* comparison, is the uniformly dependable result with a good operator in applying to *every foot of track* a compressive force of 500 pounds spread over 8 square inches of tamping face on each side of both rails. This machine method of tamping is the only way to force the concrete into complete, uniform contact with tie bearing surfaces, and at the same time increase its density at this vital section.

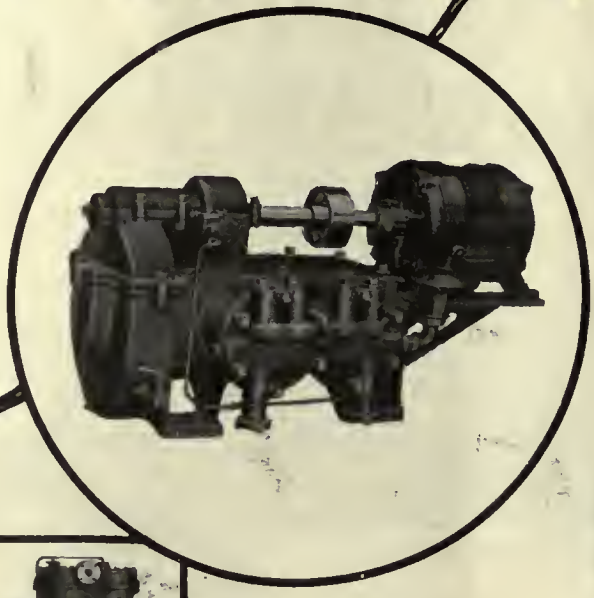
Make no mistake! Such advantages, available only with International track machines, are the only way of eliminating the human factors of limited energy, fatigue, lack of intelligence and failures in supervision.

Now is the time to investigate fully the advantages of Steel Twin Ties and modern track building machinery.

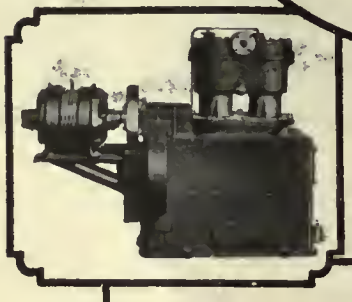
THE INTERNATIONAL STEEL TIE CO.
CLEVELAND, OHIO

# STEEL TWIN TIE TRACK
## THE BASE OF MODERNIZATION

# WESTINGHOUSE—NATIONAL *Air Compressors*



## Save Time and Labor

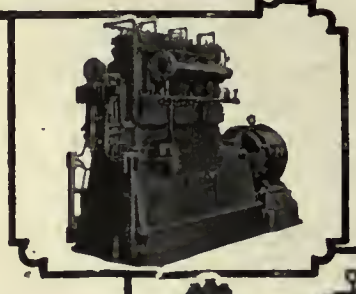


Type "N" Compressor—12 to 60 cu.ft. displacement.

2V Type Compressor—75 to 150 cu.ft. displacement.



3VS Type Compressor —208 to 468 cu.ft. displacement.



3VD Type Compressor —550 to 700 cu.ft. displacement.



Steam Driven Types—35 to 150 cu.ft. displacement.

FIRST to employ compressed air as a force for braking trains, the railways have by no means been the last to discover its value as a time and labor saving agent in the car barn, power house, and shop.

Westinghouse National Air Compressors are, of course, the logical selection for this work as they were originally developed for railway service where simplicity, compactness, durability, accessibility, easy maintenance, automatic control and quiet operation were basic essentials. And railway men have found in these compressors the same soundness of design and sincerity of manufacture which distinguishes all other Westinghouse machinery and equipment.

There is a Westinghouse National Stationary or Portable Compressor exactly suited to your needs. Write for descriptive literature or ask our representative to recommend the type best suited to your work.

**Westinghouse Traction Brake Co.**
*Industrial Division*
General Offices and Works: Wilmerding, Pa.

# Good Money
## *after Good Money*

"It does not pay," as the saying goes, "to throw good money after bad." But money invested in the Electric Railway Industry is still *good* money and roads which have taken definite action—following the modernization program—have found that it pays to increase their investment in equipment of the type which increases their return.

An investment in—

## TREADLE-IZATION

is one of the modernizing steps which will help to make and keep your previous investments GOOD.

NP

NATIONAL PNEUMATIC COMPANY

*Executive Office:* Graybar Building, New York

*General Works,* Rahway, New Jersey

CHICAGO
518 McCormick Building

MANUFACTURED IN TORONTO, CANADA, BY
Railway & Power Engineering Corp., Ltd.

PHILADELPHIA
1010 Colonial Trust Building



# YOU CAN'T





# SELL COTTON in a silk stocking market



SOUND business demands a product that *meets the demand* of the market. Yesterday's methods, yesterday's products can't sell today's customer.

This applies to transportation, to street car rides—as well as to stoves or hotel accommodations.

Sell modern transportation *today*—meet the demand for better transportation *today*—and tomorrow will find you ready to meet tomorrow's need.

Use Cincinnati cars.

Use them today. Completion doesn't wait for you to catch up. But you can hold your present customers, and build new business with Cincinnati cars. And Cincinnati cars pay for themselves not only out of increased earnings, but from savings created by decreased operating costs.

Use Cincinnati cars today.

CINCINNATI CAR COMPANY
CINCINNATI, OHIO

CINCINNATI BALANCED LIGHTWEIGHT CARS



# AMCRECO -POLES-

## *reduce annual charges*

THE real cost of a pole, pile or tie is the total cost per year over its entire life. This annual charge is composed of three items—depreciation to write off first cost at the end of its useful service, interest on the investment, and maintenance.

Amcreco products reduce annual charges in two ways; first, longer life, spreading first cost over a greater number of years and, second, lower maintenance charges, because the strength is unimpaired with advancing age. For example, one large user of Amcreco products reports a saving of $281.98 per year per mile of pole line and $528 per mile of track for creosoted ties under pavement costing $1.00 per sq.yd.

When you select poles, piles or ties, keep annual charges in mind — not first cost. Consult our nearest office for further information on Amcreco products.

SALES OFFICES:
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**AMERICAN CREOSOTING COMPANY**
INCORPORATED

COLONIAL CREOSOTING COMPANY INCORPORATED

AMCREO LOWRY PROCESS CREOSOTED WOOD

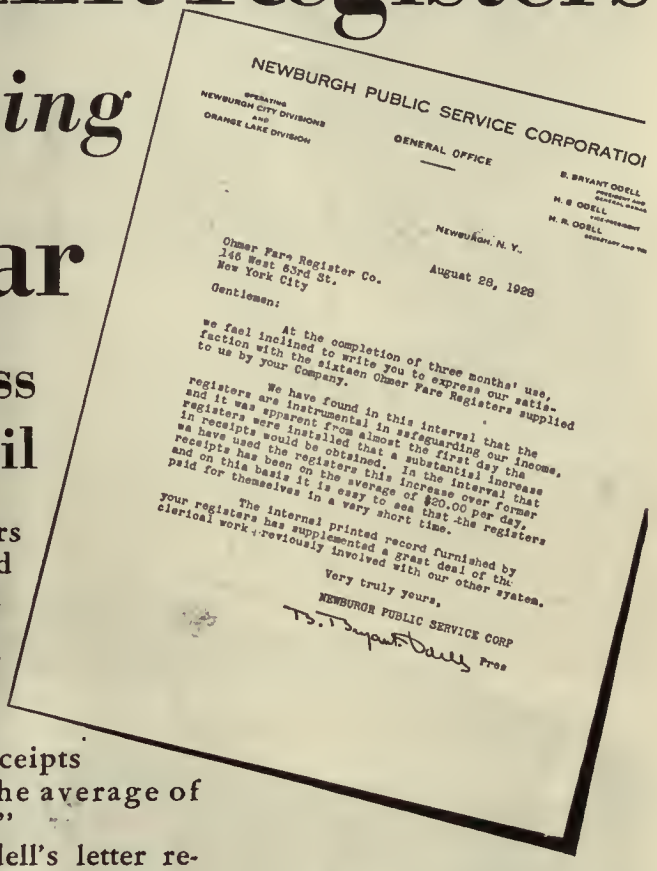
GEORGIA CREOSOTING COMPANY INCORPORATED

LOUISVILLE ~ KENTUCKY

ERJ12-22Gray

# Sixteen OHMER Registers *Show a Cash Saving of $7,300 a Year*

## . . . and *eliminate* a mass of tedious clerical detail



NEWBURGH PUBLIC SERVICE CORPORATION

OPERATING NEWBURGH CITY DIVISIONS AND ORANGE LAKE DIVISION

GENERAL OFFICE

E. BRYANT ODELL, PRESIDENT AND GENERAL MANAGER
H. S. ODELL, VICE-PRESIDENT
H. R. ODELL, SECRETARY AND TREASURER

NEWBURGH, N. Y.

August 28, 1928

Ohmer Fare Register Co.
146 West 63rd St.
New York City

Gentlemen:

At the completion of three months' use, we feel inclined to write you to express our satisfaction with the sixteen Ohmer Fare Registers supplied to us by your Company.

We have found in this interval that the registers are instrumental in safeguarding our income, and it was apparent from almost the first day the registers were installed that a substantial increase in receipts would be obtained. In the interval that registers were in use, substantial increase in receipts would be obtained. In the interval that we have used the registers this increase over former receipts has been on the average of $20.00 per day, and on this basis it is easy to see that the registers paid for themselves in a very short time.

The internal printed record furnished by your registers has supplemented a great deal of the clerical work previously involved with our other system.

Very truly yours,

NEWBURGH PUBLIC SERVICE CORP

By E. Bryant Odell Pres

MR. B. B. Odell, President and General Manager of the Newburgh Public Service Corporation, knows the importance of adequate fare protection. So he had sixteen OHMER Registers installed on vehicles operated by his company.

It took Mr. Odell only three months to realize the tremendous savings brought about by these registers. He writes, ". . . it was apparent from almost the first day the registers were installed that a substantial increase in receipts would be obtained . . . this increase over former receipts has been on the average of $20.00 per day."

Read Mr. Odell's letter reproduced at the right. It's convincing evidence of OHMER'S ability to protect profits on every fare transaction . . . and to simplify accounting systems immeasurably.




*One type of* OHMER *Fare Register installed in a motor bus. There are* OHMER *Systems expertly adapted to every transportation and merchandising need.*

## OHMER *Fare Registers for dependable fare protection*

The experience of the Newburgh Public Service Corporation is typical of hundreds of similar concerns. For wherever cash fares are taken . . . on interurbans, electric railways, buses . . . OHMER Registers have always been a mark of protection and efficiency. Years of pioneering, dominant leadership, a nation-wide organization, these assure users of OHMER Systems the utmost in economical, efficient and dependable fare protection.

Write today for complete information about the OHMER Fare Register. Discover its many advantages. Learn *why* OHMER Registers installed thirty years ago are still giving daily service . . . still performing the vital function of safeguarding profits. Investigate this money-saving proposition *today*. Find out what it will do for you . . . for your business.

OHMER

Reg. U. S. Pat. Off. and other Countries

FARE REGISTER COMPANY

DAYTON, OHIO, U. S. A.




*Special trip motor coach of 100% Goodyear-equipped fleet operated by the Twin City Motor Bus Company of St. Paul, Minnesota, shown here with Goodyear-equipped Jefferson Airways passenger plane*

GOODYEAR

Copyright 1928, by The Goodyear Tire & Rubber Co., Inc.

# They have the quality for revenue mileage!

**Experienced operators often say that all they want from their bus tires can be summed up in one requirement:**

## *Uninterrupted revenue miles!*

**Every quality of tire construction and design, they point out, should play its proper part in producing this essential result.**

*Freedom from trouble on the road—*

*Tractive power for starting and stopping—*

*A safe, sure, anti-skid grip on any surface—*

*The inbuilt strength to stand up for thousands of miles at low tire mile cost—*

All these bear directly on that prime essential of *Uninterrupted Revenue Miles.*

Because they meet this supreme requirement more completely than any others, Goodyear Pneumatic Cord Bus Tires are greatly preferred.

Their great durability, proved under every operating condition, results from their casing construction of SUPERTWIST. This extra-elastic, extra-durable cord fabric flexes easily, yielding and recovering with the inequalities of the road, preventing bruises and eliminating shoulder breaks. Fewer carcass failures and fewer tire changes on the road are the result.

This same SUPERTWIST resilience is also the secret of the easy riding comfort provided by Goodyear Tires—the extra cushioning reflected in both lower vehicle repair bills and greater passenger satisfaction.

Coupled with these body qualities are the distinct advantages of the Goodyear ALL-WEATHER TREAD.

The sharp diamond-shaped blocks of this famous tread offer the greatest spread of gripping surface to the road at all times.

They cut away the slippery film on wet pavements—they dig deep into snow or mud—they seize and grip, to go ahead with mighty power or to come to a skidless stop.

Goodyear Pneumatic Bus Tires, made with SUPERTWIST and the ALL-WEATHER TREAD, are powerful, dependable, comfortable and safe. They give high mileage at low tire mile cost. They are products worthy of "The Greatest Name in Rubber."

*For every Goodyear Cord Bus Tire there is an equally fine Goodyear Tube, built especially to the needs of bus service, and there are also Goodyear Rubber Tire Chains*

**BUS TIRES**



# Freedom from breakage

Because the breaking of a gear or pinion tooth often results in serious traffic delays, no reasonable effort should be spared to protect equipment against such an occurrence.

Gearing must be ductile so as not to break, and it must also be hard enough to give long life in service. The carefully selected steel in G-E gearing is scientifically heat-treated and embodies a careful balance of the qualities of long life and freedom from breakage.

It will pay you to buy G-E gearing—the gearing that is hard but not brittle—that need be replaced only when long service has worn it out.

330-97

**GENERAL ELECTRIC**

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

# Electric Railway Journal

*Consolidation of*
*Street Railway Journal and Electric Railway Review*

McGraw-Hill Publishing Company, Inc.
James H. McGraw, *Chairman of the Board*
Malcolm Muir, *President*
H. C. Parmelee, *Editorial Director*

CHARLES GORDON, *Editor*

Louis F. Stoll,
*Publishing Director*

*Volume 72* New York, Saturday, December 22, 1928 *Number 25*

## Paracelsus, Wherever He Gazed, Beheld a Star

IT HAS truly been said that ideals rule the world, even while the world cynically derides them. Ideals lift men above the commonplace and the material. They are frequently hidden and guarded behind the human masks that are worn to meet a hard work-a-day materialism. Only for brief moments are the masks themselves thrown aside. And only then does mankind, in every walk of life, reveal its ruling spirit. At this season of the year we call it the Christmas spirit.

It is lack of imagination that makes life's Scrooges what they are and that blinds them to the many manifestations of this Christmas spirit in our daily work and play. When the employees of the Louisville Railway sat in a great banquet to celebrate their own devotion to duty and to the saving of human life and suffering, the Christmas spirit walked among them to bless their contribution to human happiness. When the entire city of Richmond rose up to honor a public service management which had won national honors for the "Old Dominion" through its accomplishment in rehabilitating a vital community transportation service, it was a shining demonstration of the practical application of this same spirit. Something transcending monetary award motivates men who face driving storm and howling blizzard to insure the safety and comfort of their fellows.

This Spirit of Christmas is, after all, a very practical thing. We see it reflected on every hand, wherever men work or play. In our work we call it the spirit of service. In our play we name it good sportsmanship. A great nation-wide association of business men have adopted as their motto: "He who serves best profits most." The Christmas spirit is a state of mind that raises men above the level of a mere struggle for existence. At this season we cast aside that struggle, for a moment, to rejoice at the coming of the simple Man of Galilee and open wide our hearts.

## Electrification After 124 Years

A WELL-KNOWN adage declares "Happy the country which has no history." If this is true also of railways, a line in Swansea, Wales, must have had a joyful time for the 124 years that it has been in existence. At least it has been spared growing pains. Though continuously in operation, it has remained the same length —6 miles—that it was when horses drew the first car from Swansea to Oystermouth. Like the one-horse shay celebrated by Oliver Wendell Holmes, it has kept serenely at its work while empires have risen and fallen.

For more than 70 years, horses continued to haul cars over this modest Welsh railway. Then, in 1877, a great step forward was taken. A few steam locomotives were purchased, but the cars continued to be of the street railway type. Finally, in this eventful year of 1928, when some pessimists are saying that electric cars are becoming obsolete, the directors decided to adopt electric power. This momentous event in the history of a 124-year-old road is chronicled in this issue.

Managers elsewhere, harassed by many problems of street congestion, automobile and bus competition, demands for extension and talk about abandonment, will extend congratulations to their British compeer. They will express the hope that it may have another 124 years of continued life and success with no further change in motive power.

## Community Welfare the Proper Basis for Traffic Regulation

BRANDING as obsolete the theory that streets are designed for moving vehicles, the Fifth Avenue Association of New York City has come out flatly in favor of parking on that important thoroughfare. Whatever may be said concerning the theory, the practice of moving vehicles is practically obsolete there. Traffic moves at a snail's pace now and complete stagnation appears to be not far away.

Despite the present serious congestion, a large majority of the Fifth Avenue merchants are reported to believe that liberal parking regulations are vital to the successful conduct of their business. They "estimate" that 30 per cent of their customers come by private automobile and they seek therefore to maintain Fifth Avenue as a garage for their customers rather than to allow it to function as a real traffic artery.

The weakness of this position lies in the fact that Fifth Avenue belongs not to the particular stores located there but to the whole city. If no one but the customers themselves suffered from the present traffic congestion the public might well regard it with indifference. But many people other than customers use this important street, and they, too, suffer from the congestion. Moreover, one need not be a mathematician to calculate that the curb space on Fifth Avenue is insufficient to accommodate the number of customers claimed to come by automobile. The fact is that many of these automobiles are parked on other streets besides Fifth Avenue itself. In other words, the aristocratic avenue trade is usurping a large amount of curb space on the humble side streets. This is one of the most serious causes of traffic congestion in mid-town Manhattan. Undoubtedly the public as a whole would be better off if Fifth Avenue and the adjacent streets were used for traffic instead of garage purposes.

In pleasing contrast to the selfish and parochial attitude of the Fifth Avenue Association is that of the

Citizens Traffic Committee recently organized under the auspices of the Board of Trade. Many leaders in business and civic affairs are included in this group. As one of the speakers at the organization meeting pointed out, there has been too much talk about individual traffic problems and too little planning for the city as a whole. It is thought by the committee that a means may be found to make better use of existing facilities and thus bring speedy relief. There is sound common sense in this proposal, and the wide variety of interests represented on the committee affords ground for hope that this body is headed toward a city-wide plan of improvements. Only by considering the welfare of the entire community can a real solution of the traffic problem be found.

## Detroit Substitutes Buses for Jitneys

HISTORY was made in Detroit on Nov. 25 when the Department of Street Railways inaugurated service on the first of its de luxe bus routes, established to accommodate the former patrons of the ousted jitneys. Whether the decision to provide this service will prove to be a wise one or not remains to be seen, as actual operating experience is the only measure by which a venture of this kind can be judged. However, it is an unusual step, a very significant one, and it will bear close watching by all transportation men.

De luxe service has been given in other cities, notably Pittsburgh, Toronto, Washington and Newark, but the Detroit installation is very much different from any of these. Not only is the character of service somewhat different, but also it was instituted for a much different reason than any of the others. In Washington, some of the lines were developed as sightseeing lines. In Pittsburgh, the lines were started to develop an entirely new class of patronage, those who were accustomed to driving to the city in their own automobiles. The de luxe service in Detroit, however, was started after the city passed an ordinance demanding all jitneys to cease operation, and was instituted entirely to serve the former patrons of the jitneys. This is a somewhat different set of conditions than experienced in any other city and the very nature of the installation and the size of the proposed system make it an outstanding venture.

Much criticism has been leveled against the new system. A great deal of this, of course, has come from the owners of the jitneys that were ousted, and other chronic kickers. The argument has been presented that the D.S.R. should have purchased more large capacity buses and street cars to increase the service on its mass transportation lines rather than to set up an entire system of small capacity, high-speed buses. In support of this, proponents of the plan for more mass transportation vehicles point out that service is inadequate on practically all of the lines and that the proper move would have been to add more vehicles to relieve this condition. They claim also that the former jitney patrons, numbering about 80,000, could have been accommodated with a much smaller number of larger buses or street cars and that the company would have assumed less risk of losing on the installation. The opposite stand is that the majority of the former jitney patrons would not use mass transportation vehicles, even if more were provided, but rather that they would use their own or their neighbors' automobiles.

The Department of Street Railways also has been criticized for ordering as many as 160 parlor coaches and definitely deciding upon several routes, in view of the system being in every sense of the word an experiment. The chief reason for the company instituting so many lines was to take care of as many of the former jitney patrons as possible. The city was responsible for ousting these vehicles and felt a responsibility to give the people a comparable service.

A few commentators have gone so far as to claim that the company decided to use buses of too small a capacity. In this respect, the company was very wise, for only with small vehicles can a service be given comparable to that of the jitneys. Whether or not such a service can pay on 10, 15 and 20-cent fares remains to be seen. These buses are to give what may be called correctly a convenience service and not a necessity. It really accommodates a class of patrons that is willing to pay higher fares, and as such should be considered from the angle of opening up a new field for organized public transportation. Should the Detroit venture prove successful, no doubt other cities will take steps to install similar systems. The developing of higher classes of service by buses, with correspondingly higher fares, has been advocated for some time, and it is encouraging to see a step in this direction so important as that in Detroit.

## Intricacies of the Negligence Law

THE usual rule that a person must bear the consequences of his own carelessness is by no means universally applied in law. Its principal exception is that if one careless person injures another, and the latter would not have been hurt if he himself had not been careless, the contributory negligence of the second person may save the first from paying damages. Still another exception arises when the person injured is engaged in unlawful business, where this business contributed to, or as it is termed, was "causable" to the accident.

In a number of recent street railway cases this principle has been applied, and the courts have gone to considerable trouble to define the circumstances in which violations of the law by the person injured have been, or have not been, contributory to the accident. Thus, it has been held in Massachusetts (Bacon *vs.* B.E.R. Co., 152 N.E., 35) that an improperly registered automobile is a nuisance on the highway, and consequently if it is injured in a collision with a street car the railway company is not responsible. This case is especially interesting because the automobile was licensed, but the owner, a woman who had been married for two years, had registered it under her maiden name.

A case involving a somewhat similar principle was decided the other way in New York State in Klinkenstein *vs.* Third Avenue Railway, 168 N.E., 886, where a car collided with a bus which was operating under a permit from the Department of Plant and Structures but was violating the law because it had not also obtained a certificate of convenience and necessity from the Public Service Commission. In this case the court held the railway responsible on the ground that the illegal act was not that the bus was on the street but that it was carrying passengers for hire. Hence, the violation of the statute had no direct connection with the injury which was suffered from the collision. Moreover, the statutes covering the licensing of common carriers provided penalties for failure to comply with them, and the court thought it should not add other penalties.

So important do courts consider the question involved that the whole subject has just been reviewed in a lengthy

ecision by the Supreme Court of New Hampshire Johnson vs. Boston & Maine R.R., 143 A., 516). In his case an automobile driver was injured by a train t a grade crossing and lost his claim for damages be-ause it was discovered that he had not taken out a state river's license. The court pointed out that although the aw required the driver to have his license with him, it nade a difference whether he had simply left it home y carelessness or whether he had never applied for one. t pointed out that the purpose of the law was to exclude ncompetent drivers from the roads, and this could best e done by requiring all drivers to be licensed. Had the river simply left his license at home the court intimated he decision might have been in his favor.

In expanding this idea, the court cited the case of an njury to a boy who was violating the law by working vhen he should have been in school, but here the viola-ion made no difference because the law was designed to promote education and for no other purpose. Violation f the Sunday law comes under the same rule, the court ointed out, as does driving on the wrong side of the oad, unless that contributes to the accident.

These decisions are of particular interest in that they ave a bearing upon several important phases of neg-igence cases.

## Are the Earnings Recorded in Red or Black?

RED or black? That was the question asked, not in Monte Carlo, but on a certain small electric railway system where a decision was being made whether certain lines should have improved rolling stock, new track and overhead renewals, or should be abandoned. In other words, it was a process of separating the sheep from the goats. The engineering office of the holding company in a remote city called "Red." The superintendent of the local railway department answered "Black." The engi-neers showed that the line in question had failed by a good many thousand dollars to meet its operating ex-penses, while the superintendent's analysis indicated an operating surplus about equal in amount to the deficit shown by the engineers.

When the reason for the discrepancy was sought, it was found that the engineers had obtained their results by allocating expenses on an arbitrary basis of the ton-mile, the car-mile or the car-hour, without considering the relation of these elements to the particular section of the property. The superintendent had apportioned each item according to what he knew were the peculiar physical and operating characteristics of the route in comparison with the rest of the property.

Going further into the explanation, the superintendent was able to prove that "Black" was the correct answer. Here is how he did it.

Energy was determined from actual watt-hour meter records for the type of car and mileage operated. Main-tenance of track and roadway, signal and interlocking equipment was taken from direct expenditures on differ-ent lines as far as possible, the rest being prorated according to the ton-miles operated per line. Main-tenance of paving was divided in proportion to the ton-miles operated on each line in the paved districts. Maintenance of electric lines was proportioned by route-miles. Maintenance of buildings and fixtures was pro-rated according to the car-miles on each line. To dis-tribute these, the items equipment cost and wages of carhouse employees were studied specially, the number of car defect reports and pull-ins being taken, with a pull-in counted as three defects. Miscellaneous car service expenses were divided in proportion to the car-miles operated on each line. The transportation expense was proportioned according to the platform hours on each line. The ratio of all other operating expenses, exclusive of traffic, general and miscellaneous expenses and taxes were determined for these lines as compared with the total for all lines of the system, and then traffic, general and miscellaneous expenses and taxes were apportioned to each line in the same ratio.

Some of this allocation may be debatable, and some of the assumptions made may be questioned. But the method used of determining individually from known distributions each of the principal items of expense and the result obtained give a striking illustration of the need for careful analysis before the decision is made to aban-don investments worth thousands of dollars.

## Overlooking the Asset of Safety

AGAIN the committee designated by the American Museum of Safety has met to select the winners of the Anthony N. Brady Memorial Medals, the names to be announced at a meeting of the Metropolitan sec-tion of the A.E.R.A. in New York on Jan. 4, 1929. Again the number of participants has been disappoint-ingly small, and the choice of the committee was of neces-sity limited to the all too few excellent briefs submitted.

The apathy of the industry toward this very meritori-ous contest is difficult to explain. Surely, there is no lack of interest in safety and accident prevention. One of the most acute problems before the transportation in-dustry today is that of reducing the appalling wastage—for it is nothing else—involved in the settlement of dam-age claims. To fall into the vernacular, it would appear as though those companies which fail to participate in this contest are overlooking a bet. Intrinsically, of course, the award is not great. But the moral and psy-chological value of these medals can, if properly capital-ized, be made far-reaching in its consequences.

Winner of the Brady Award for Safety! This is an asset and an honor not to be overlooked. Consider the effect upon the personnel, upon the safety habits of the community. Here, indeed, public opinion will say, is a mark at which to shoot. Our street railway is distinguished above all others for its safety of operation. The trainmen on our cars have contributed to make our community an unusually safe place to live in. Why cannot the rest of us be equally distinguished? Our truck drivers, our autoists—are they doing equally well? Will they co-operate to the end that we may maintain civic leadership in this respect?

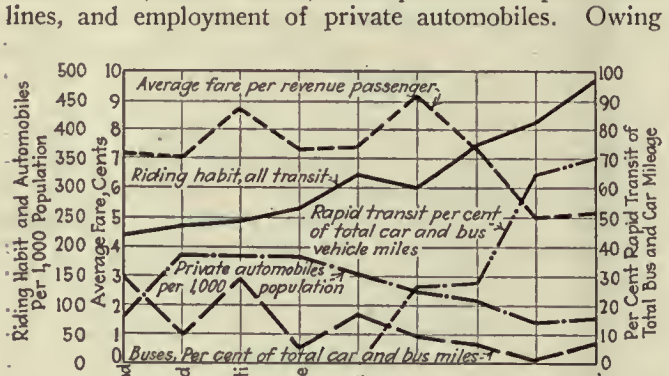
Consider the effect in accident litigation wherein the trolley company is involved. Will not opinion uncon-sciously lean toward a company noted for its safety record? Will not witnesses be inclined to favor such a company? Small factors, all, perhaps, but looming large in the general scheme of things and sure to be reflected in ultimate damage cost experience. Congratulations to the winners of this year's awards, whoever they may be! But the industry needs to wake up on the possibilities of this contest. Safety of its service is one of the great-est of the assets which the electric railway can claim in its struggle with the competition of the individual auto-mobile. There should be scores of entries for next year's awards instead of the mere handful who have during the past two years had the vision and the will-to-win spirit to enter this important competition.

## *Analysis Made of*

# Factors Affecting Riding Habit in Large Cities

**Study by Beeler Organization indicates that the influence of rapid transit lines is to increase street car riding, while the tendency of bus operation is to decrease it. Failure to provide rapid transit encourages automobile competition**

AN EXTENDED analysis of the various factors affecting the riding habits in large cities has recently been made by the Beeler Organization of New York for the Brooklyn-Manhattan Transit Company and the Brooklyn City Railroad. The analysis, in the form of a report, has been submitted to the Public Service Commission by counsel for these companies. It is expected to assist the commission in deciding the question of additional bus franchises in Brooklyn. The report considers the influence on car riding of such factors as rate of fare, use of buses, development of rapid transit lines, and employment of private automobiles. Owing




**Factors affecting riding habit in nine large cities, 1927**

to the general interest in the nature of this subject, an abstract of this study has been prepared for these columns. The general discussion appears in this issue. A subsequent article will give details of the individual cities.

The results show that the cities employing rapid transit are in a class by themselves. Because of its superior time-saving qualities, great changes in the distribution of population and in the location of its business and industrial sections are occasioned by the introduction of rapid transit. In such cities, the surface lines are not generally patronized for long haul rides, but by the short haul rider to rapid transit stations and to business, theater and shopping districts. Hence, the total car riding per inhabitant is noticeably larger than before the introduction of rapid transit. Indeed, the construction of a rapid transit line often brings an increase in passengers carried by the surface lines only, though the riding changes from long haul to short haul.

In large and medium sized cities, where rapid transit facilities do not exist, the automobile is employed extensively to provide rapid transportation from point to point and the taxicab comes into greatly enlarged use, to the detriment of the slower moving service, and car riding falls off. Rapid transit lines serve to create short haul riding on surface lines because many rapid transit riders use a surface line at one or both ends of the trip, but the use of the automobile does not have this effect. Another element assisting to the decline of the riding habit, in cities without rapid transit, is the growth of community business, shopping, banking and amusement centers in outlying districts. To some extent increase in rates of fare has had its effect. In this connection it may be noted that the bus fare is generally higher than the street car fare.

### Fares and Riding Habits

Today there are two general schools of thought on the subject of fares. One is that the increased fare has brought about a decrease in riding. The other is that the decrease in riding has made the increase in fare necessary, especially in later years after the first fare increases were made to adjust fares to the new level of wages and cost of materials. This suggests a third probability: i.e. that in later years the buses, being largely competitive, have caused a decrease in car riding which in turn has made an increased fare necessary.

Table I gives rides per inhabitant and average fare in each of five cities without rapid transit, yearly from 1918 to date. While the figures show a decrease in riding with an increase in fare, they do not indicate a definite relation between the riding habits and rate of fare that holds true in every case. For example in Cleveland with a 58 per cent increase in fare, there has been a 29 per cent drop in riding habit, while in Cincinnati, although the fare has increased 74 per cent the riding habit has dropped but 5 per cent. In fact, Cleveland has the lowest and Cincinnati the highest rate of fare in these five cities. One outstanding fact brought out by this table, however, is that the riding habit in these cities begins to fall at about the point where fares increased 30 per cent above the 1918 level. Furthermore, it may be noted, that coincident with the marked increase in bus operations in the past three years, the total surface riding habit, including that on the bus, on the average has continued to decline. These data do not indicate that the

TABLE I—FARES AND RIDING HABIT IN FIVE CITIES SERVED BY STREET CARS AND BUSES ONLY

| Year | Cleveland: Rev. Rides per Inhabitant Per Cent of 1918 | Cleveland: Average Fare In Cents | Cleveland: Average Fare Per Cent of 1918 | St. Louis: Rev. Rides per Inhabitant Per Cent of 1918 | St. Louis: Average Fare In Cents | St. Louis: Average Fare Per Cent of 1918 |
|---|---|---|---|---|---|---|
| 1918 | 100 | 4.44 | 100 | 100 | 5.50 | 100 |
| 1919 | 103 | 5.22 | 117 | 106 | 6.25 | 114 |
| 1920 | 112 | 5.21 | 117 | 114 | 7.00 | 127 |
| 1921 | 95 | 6.04 | 136 | 111 | 6.89 | 125 |
| 1922 | 91 | 5.81 | 131 | 111 | 6.89 | 125 |
| 1923 | 92 | 5.36 | 121 | 113 | 6.92 | 126 |
| 1924 | 83 | 6.09 | 137 | 110 | 7.03 | 128 |
| 1925 | 79 | 6.14 | 138 | 111 | 7.17 | 130 |
| 1926 | 77 | 6.43 | 145 | 109 | 7.19 | 131 |
| 1927 | 71 | 7.01 | 158 | 103 | 7.45 | 136 |

| Year | Baltimore: Rev. Rides per Inhabitant Per Cent of 1918 | Baltimore: Average Fare In Cents | Baltimore: Average Fare Per Cent of 1918 | Cincinnati: Rev. Rides per Inhabitant Per Cent of 1918 | Cincinnati: Average Fare In cents | Cincinnati: Average Fare Per Cent of 1918 |
|---|---|---|---|---|---|---|
| 1918 | 100 | 5.13 | 100 | 100 | 4.99 | 100 |
| 1919 | 105 | 6.02 | 117 | 104 | 6.28 | 126 |
| 1920 | 107 | 6.75 | 132 | 104 | 7.44 | 149 |
| 1921 | 100 | 6.78 | 132 | 93 | 8.18 | 164 |
| 1922 | 98 | 6.83 | 133 | 93 | 7.52 | 150 |
| 1923 | 99 | 6.85 | 133 | 94 | 7.64 | 153 |
| 1924 | 94 | 7.15 | 139 | 86 | 9.15 | 183 |
| 1925 | 93 | 7.36 | 143 | 82 | 9.62 | 193 |
| 1926 | 92 | 7.36 | 143 | 91 | 8.73 | 175 |
| 1927 | 89 | 7.34 | 143 | 95 | 8.70 | 174 |

| Year | Richmond: Rev. Rides per Inhabitant Per Cent of 1918 | Richmond: Average Fare In Cents | Richmond: Average Fare Per Cent of 1918 | Average Five Cities: Rev. Rides per Inhabitant Per Cent of 1918 | Average Five Cities: Average Fare In Cents | Average Five Cities: Average Fare Per Cent of 1918 |
|---|---|---|---|---|---|---|
| 1918 | 100 | 4.35 | 100 | 100 | 4.97 | 100 |
| 1919 | 107 | 4.71 | 118 | 104 | 5.81 | 117 |
| 1920 | 108 | 5.33 | 123 | 110 | 6.35 | 128 |
| 1921 | 97 | 5.91 | 136 | 100 | 6.71 | 135 |
| 1922 | 79 | 5.88 | 135 | 98 | 6.58 | 133 |
| 1923 | 93 | 5.88 | 135 | 100 | 6.46 | 130 |
| 1924 | 90 | 5.87 | 135 | 94 | 6.96 | 140 |
| 1925 | 89 | 6.26 | 144 | 92 | 7.13 | 144 |
| 1926 | 91 | 7.03 | 162 | 92 | 7.18 | 145 |
| 1927 | 87 | 7.12 | 164 | 88 | 7.44 | 150 |

TABLE II—FARES AND RIDING HABIT OF STREET CARS AND BUSES COMBINED IN FOUR CITIES WITH RAPID TRANSIT SERVICE

| Year | Brooklyn: Rev. Rides per Inhabitant Per Cent of 1918 | Brooklyn: Average Fare In Cents | Brooklyn: Average Fare Per Cent of 1918 | *New York: Rev. Rides per Inhabitant Per Cent of 1918 | *New York: Average Fare In Cents | *New York: Average Fare Per Cent of 1918 |
|---|---|---|---|---|---|---|
| 1918 | 100 | 4.78 | 100 | 100 | 4.94 | 100 |
| 1919 | 98 | 4.92 | 103 | 100 | 5.02 | 102 |
| 1920 | 115 | 5.07 | 106 | 107 | 5.17 | 105 |
| 1921 | 107 | 5.01 | 105 | 108 | 5.21 | 105 |
| 1922 | 120 | 5.01 | 105 | 121 | 5.18 | 105 |
| 1923 | 123 | 5.01 | 105 | 121 | 5.19 | 105 |
| 1924 | 123 | 5.00 | 105 | 121 | 5.22 | 106 |
| 1925 | 123 | 5.00 | 105 | 118 | 5.29 | 107 |
| 1926 | 122 | 4.99 | 105 | 116 | 5.29 | 107 |
| 1927 | 122 | 4.99 | 105 | 116 | 5.38 | 109 |

| Year | Chicago: Rev. Rides per Inhabitant Per Cent of 1918 | Chicago: Average Fare In Cents | Chicago: Average Fare Per Cent of 1918 | Boston (a): Rev. Rides per Inhabitant Per Cent of 1918 | Boston (a): Average Fare In Cents | Boston (a): Average Fare Per Cent of 1918 |
|---|---|---|---|---|---|---|
| 1918 | 100 | 5.02 | 100 | 100 | 5.84 | 100 |
| 1919 | 106 | 5.87 | 117 | 92 | 8.86 | 152 |
| 1920 | 108 | 7.14 | 142 | 94 | 9.87 | 169 |
| 1921 | 104 | 7.98 | 159 | 93 | 9.56 | 164 |
| 1922 | 103 | 7.31 | 146 | 97 | 8.93 | 153 |
| 1923 | 111 | 6.99 | 139 | 103 | 8.71 | 149 |
| 1924 | 114 | 7.07 | 141 | 102 | 8.73 | 150 |
| 1925 | 114 | 7.09 | 141 | 96 | 9.26 | 159 |
| 1926 | 116 | 7.08 | 141 | 97 | 9.27 | 159 |
| 1927 | 115 | 7.10 | 141 | 95 | 9.27 | 159 |

*Includes entire city of five boroughs. (a) Rapid transit included.

introduction of buses increases the total number of riders. Rather, they show that by large increases in service each year, the bus has taken more and more passengers from the street cars.

Table II presents similar figures to those in Table I but in four communities with rapid transit, i.e., Brooklyn, New York City as a whole, Chicago and Boston, a very different tendency is shown to prevail. These cities are all served by rapid transit lines which have stimulated development in outlying districts and increased local surface car riding. In Boston, where the rapid transit and surface lines are completely unified, and a 10-cent fare pays for a ride on both surface and rapid transit lines, even though more than two buses or cars may be used in making a trip, an apparent decrease in the riding habits is shown. This situation is not comparable to the other rapid transit cities, because in the latter, where a passenger may take two or three rides today to complete his journey, he is counted each time, whereas in Boston he is counted only once. Recent checks indicate that each revenue passenger in Boston actually averages 2.16 rides to complete his journey.

In Brooklyn, where the greatest progress in rapid transit development has been made recently, the surface riding habit has maintained a new high level for the past five years, being 22 per cent higher than in 1918.

## Automobiles and Riding Habit

The automobile, with its high degree of mobility and convenient individual service, has stimulated the demand for speed in transportation. While it is a more expensive means of transit than traction or bus service, it saves time and is not subject to the delay caused by frequent passenger stops. Of course, the delays caused by traffic lights, traffic regulations, cross town traffic and general street congestion are encountered. These limitations and the difficulty of finding parking space in congested centers reduce the possible use of the automobile, particularly in the larger cities, where traffic congestion extends over greater areas and the proportion of street parking space is generally less than in the small cities, thereby stimulating the demand for the taxicab.

The riding habit during 1927, in the nine cities discussed, is shown in Table III, and in parallel columns some of the factors affecting riding habit are recorded. These include automobiles per 1,000 population, average fare per revenue passenger and per cent of total car or bus-miles operated by rapid transit, street car and bus. The data recorded are also shown in the chart on page 1070.

These data show that rapid transit is the predominating factor in stimulating riding, for the riding habit in the cities so served exceeds that in the other cities. New York, with the highest riding habit (485) has the highest percentage of rapid transit service, or 70 per cent. Brooklyn, with the second highest riding habit (412) has the second highest percentage of rapid transit service, or 64.4 per cent. Similarly, Chicago comes third and Boston fourth in both riding habit and percentage of rapid transit service.

Table III and the chart on page 1070 also show that the rapid transit cities with the highest riding habit and highest percentage of rapid transit service make the least use of the automobile. New York and Brooklyn, with the highest riding habit and percentage of rapid transit service, have the lowest automobile registration, with Chicago next and Boston fourth.

The only rapid transit city in this country besides the four mentioned in Table II, is Philadelphia, where, as in Boston, the operation of all transit facilities is co-ordinated under one management. Unlike the other cities, however, a large proportion of the taxicab service is co-ordinated with the other transit facilities. Philadelphia has not been included in these tables, because the data required for use in such an analysis of its transportation activities are not available. From published records for the year 1926, however, it is found that the total rides per inhabitant per year on all transit facilities except taxicabs in Philadelphia were 343, and the average fare per revenue passenger was 7.36. The division of total mileage between rapid transit, street car and bus

TABLE III—FACTORS AFFECTING RIDING HABIT IN NINE LARGE CITIES, 1927

| | Riding Habit All Transit | Private Automobiles per 1,000 Population | Aver. Fare per Rev. Passenger in Cents | Per Cent of Total Vehicle-Miles | | |
|---|---|---|---|---|---|---|
| | | | | Rapid Transit | Street Car | Bus |
| Brooklyn | 412 | 71.8 | 4.99 | 64.4 | 34.1 | 1.5 |
| New York | 485 | 77.7 | 5.15 | 70.0 | 23.6 | 6.4 |
| Chicago | 376 | 106.4 | 7.33 | 28.0 | 65.0 | 7.0 |
| Boston | 301 | 125.0 | 9.27 | 26.8 | 63.4 | 9.8 |
| Cleveland | 236 | 187.6 | 7.01 | .... | 91.0 | 9.0 |
| St. Louis | 324 | 154.9 | 7.45 | .... | 83.2 | 16.8 |
| Baltimore | 265 | 184.7 | 7.34 | ... | 95.0 | 5.0 |
| Cincinnati | 244 | 185.8 | 8.70 | .... | 70.3 | 29.7 |
| Richmond | 221 | 78.1 | 7.12 | .... | 70.4 | 29.6 |

TABLE IV—TOTAL MILES OF SERVICE AFTER ENLARGED USE OF BUSES

| | Revenue Miles Operated—Three Years, 1922–3–4 Before | Revenue Miles Operated—Three Years, 1925–6–7 After |
|---|---|---|
| Five Cities: | | |
| Street cars | 429,905,139 | 418,778,526 |
| Buses | 7,300,282 | 61,610,430 |
| Total | 437,205,421 | 480,388,956 |

TABLE V—REVENUE RIDES PER INHABITANT IN FIVE SURFACE TRANSIT CITIES BEFORE AND AFTER EXTENSIVE INTRODUCTION OF BUSES

| | Before (1922–3–4) By Street Cars | Before (1922–3–4) By Buses | Before (1922–3–4) Total | After (1925–6–7) By Street Cars | After (1925–6–7) By Buses | After (1925–6–7) Total |
|---|---|---|---|---|---|---|
| Cleveland | 295 | 0 | 295 | 245 | 7 | 252 |
| St. Louis | 343 | 6 | 349 | 306 | 31 | 337 |
| Baltimore | 286 | 3 | 289 | 264 | 8 | 272 |
| Cincinnati | 235 | 0 | 235 | 200 | 30 | 230 |
| Richmond* | 236 | 0 | 236 | 195 | 31 | 226 |
| Average of above | 293 | 3 | 296 | 256 | 18 | 274 |

*For Richmond, 1921 was used instead of 1922, because street cars were not operated for part of the year on account of a strike.

service is not known. However, the foregoing would indicate that the results in Philadelphia appear to be in line with those in the other rapid transit cities.

As already explained, the increased use of automobiles has undoubtedly caused a reduction of the riding habit on the established local service transportation system throughout the country. It is equivalent to the addition of a competing transportation system in the community. Since it is unorganized, however, only fragmentary statistics covering its operation are available, and it is impossible to measure its effect on the business of the established transportation system. The known facts, however, point to certain conclusions regarding the effect of automobiles on riding habit, and particularly that the riding habit in rapid transit cities has increased in the past decade while in the cities not served by rapid transit, it has decreased.

The present trend throughout the country is toward bus and street railway operation within each city. In the cities already listed, the bus service is being operated by the company providing the street railway service in Chicago, Boston, Cleveland, St. Louis, Baltimore, Cincinnati and Richmond. In Boston, Cleveland and Richmond all service has been co-ordinated and is run by one operating company. This method applies to a considerable extent in Baltimore and Cincinnati, and to a lesser degree in St. Louis and Chicago.

Such co-ordination of bus and street railway service is most desirable from the standpoint of both the public and the operating company, since it eliminates or minimizes any cause for the operation of duplicate service, and thus enables the company to develop new territory and serve the public in the most economical manner.

The charts and tables already presented give the general trend in street railway travel during the ten years ending 1927. A special study has been made to determine the effect, if any, on surface car riding of the employment of buses. To do so, the extent of the car

TABLE VI—SHOWING RIDING IN RAPID TRANSIT CITIES

| | Revenue Rides per Inhabitant Three Years, 1922–3–4 Before | Revenue Rides per Inhabitant Three Years 1925–6–7 After |
|---|---|---|
| Brooklyn: | | |
| Street cars | 213 | 208 |
| Buses | 1 | 7 |
| Total surface | 214 | 215 |
| Rapid transit | 166 | 192 |
| Grand total | 380 | 407 |
| New York City (all boroughs): | | |
| Street cars | 181 | 167 |
| Buses | 19 | 25 |
| Total surface | 200 | 192 |
| Rapid transit | 258 | 286 |
| Grand total | 458 | 478 |
| Chicago: | | |
| Street cars | 279 | 284 |
| Buses | 9 | 19 |
| Total surface | 288 | 303 |
| Rapid transit | 69 | 73 |
| Grand total | 357 | 376 |
| Boston: | | |
| Street cars and rapid transit* | 319 | 290 |
| Buses | 2 | 15 |
| Grand total | 321 | 305 |

*No segregation available.

TABLE VII—REVENUE PASSENGERS PER BUS-MILE AND CAR-MILE

| City | Average Revenue Passengers per Car and Bus-Mile for Combined Years 1925, 1926, 1927 Street Car | Bus |
|---|---|---|
| Brooklyn | 9.3 | 8.9 |
| New York | 9.9 | 6.1 |
| Chicago | 6.5 | 4.1 |
| Boston | 6.6* | 4.3 |
| Cleveland | 7.3 | 2.8 |
| St. Louis | 6.3 | 3.1 |
| Baltimore | 6.3 | 4.2 |
| Cincinnati | 5.1 | 2.2 |
| Richmond | 4.4 | 3.0 |
| Weighted average | 7.3 | 4.6 |

*Street car and rapid transit combined.

riding just before and just after the introduction of buses has been compared in the cities whose traffic has been studied in this report.

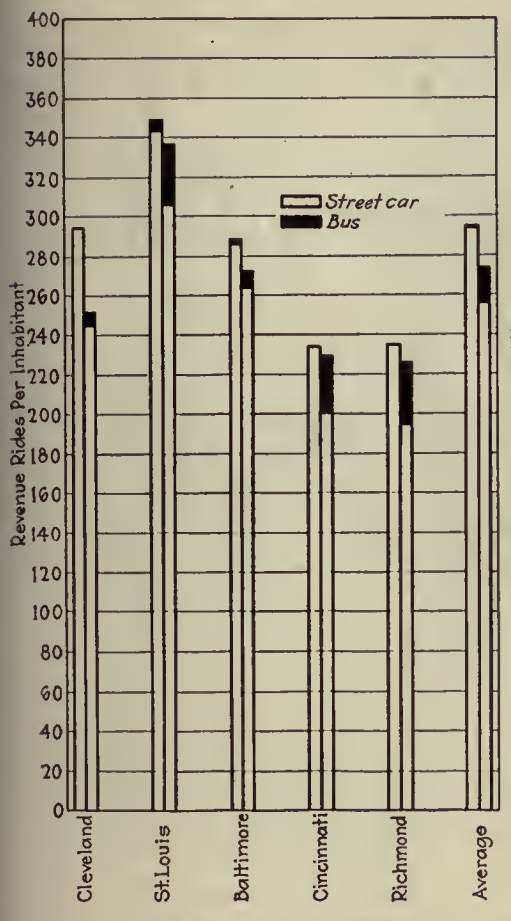
In Cleveland, Cincinnati and Richmond, bus operation began in 1925. In St. Louis and Baltimore, there was some bus operation prior to 1925, but the period of rapid expansion began in that year. Therefore, a comparison of the three-year period beginning in 1925, when bus service was developing rapidly, with the three previous years when it was inconsequential, should be of importance in ascertaining the effect of the use of the bus on surface transportation. The years comprising these two three-year periods are all normal with no peak, such as occurred in 1920, and no slump as in 1921. The total miles of service rendered during each of the three-year periods in the foregoing group of cities, before and after the enlarged use of the bus, are given in Table IV.

The total service rendered by street cars and buses increased from 437,205,421 miles to 480,388,956 miles. Coincident with this large increase in service, the total riding actually dropped from 2,894,034,734 to 2,826,252,975, or 67,781,759. Although the new bus service reached into many districts considered as inadequately served by street cars, much of it was competitive.

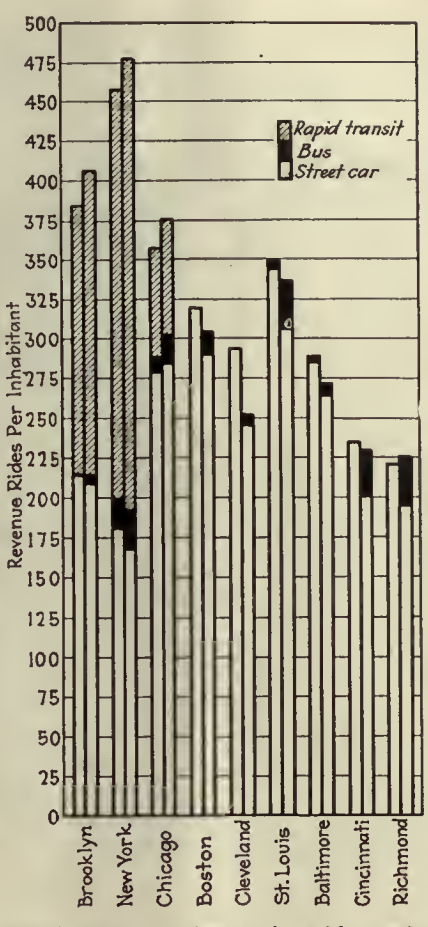
## The Cities With Rapid Transit Compared

A comparison of the annual rides per inhabitant, showing the average of the three-year period ending in 1924 with the three-year period ending in 1927 for the rapid transit cities before and after enlarged use of the bus, is given in Table V and one chart on page 1073.

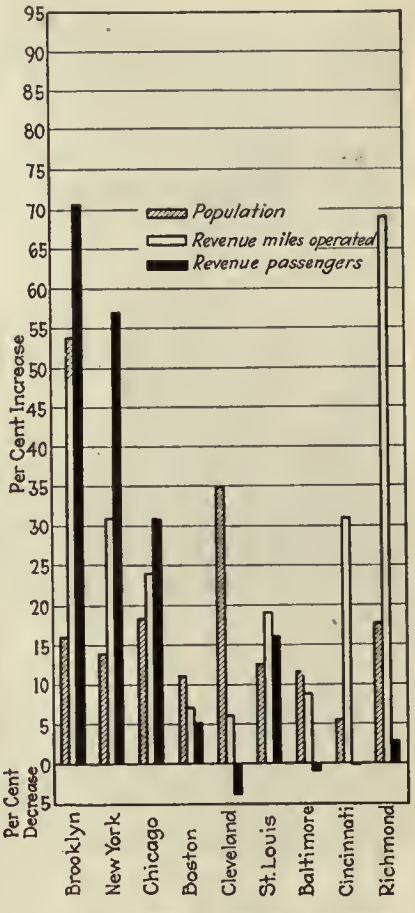
Table VI shows that in the Borough of Brooklyn and in the City of New York as a whole, where rapid transit




Annual street car and bus rides per inhabitant, three years ended with 1924 (first column) and three years ended with 1927 (second column)




Annual street car, bus and rapid transit rides per inhabitant, three years ended with 1924 (first column) and three years ended with 1927 (second column)




Per cent increase in population, miles operated and revenue-passengers for ten-year period in nine cities

facilities are the greatest and this method of transit is expanding rapidly, not only does the riding habit continue to grow but it is much higher there than elsewhere.

Chicago, with its more limited system of rapid transit service, follows Brooklyn closely in total riding habit, and like Brooklyn and New York the total riding habit of the second period shows a substantial increase over the riding habit for the first period, in direct contrast with all the cities served by surface lines only, in which the second period, with its enlarged use of the bus, shows a decrease.

Boston, the fourth rapid transit city, apparently indicates the lowest total riding habit of any of the rapid transit cities. One reason for this, as has been already shown, is that the rapid transit and surface lines are completely unified into one fully co-ordinated system where one 10-cent fare entitles the passenger to a free transfer between all classes of service. Joint prepayment inclosures admit patrons to both surface and rapid transit cars and this prevents the segregation of street car from rapid transit passengers. Bus passengers, however, are a matter of record and are indicated.

The average number of revenue passengers carried for the three years, 1925, 1926, and 1927, for each car and bus-mile operated in the cities indicated, are set forth in Table VII.

## Conclusions

From an analysis of data compiled, the following conclusions may be drawn:

1. That urban transportation should be separated into two classes; rapid transit and surface. Rapid transit is a fast service for the long distance rider on an unobstructed right of way, while the street surface lines, whether street car or bus, render a slower service.

2. Cities having the largest proportion of rapid transit service have the highest riding habit and the lowest registration of automobiles per thousand population.

3. The building of rapid transit facilities changes the function of the surface line where affected, from long haul carriers to local or feeder lines.

4. Expansion of rapid transit facilities may change the character of the riding so much that the local and feeder service riding exceeds the surface line loss in long haul passengers.

5. The total revenue rides per inhabitant are increasing faster in cities with rapid transit facilities. This is due not entirely to the fact that people are taking additional journeys but also because they will use both rapid transit and surface facilities in completing a trip where the combination saves time.

6. Buses perform a function similar to the street cars in that they operate on the street surface and at a similar speed.

7. Where the territory is already served by street cars, the addition of bus service does not stimulate any considerable amount of new business.

8. The increases in the average fare per revenue passenger, in the cities served by rapid transit, have had a minor effect on the riding habit for the riding habit has continued to increase. In the cities served by surface lines only, the riding habit has on the average held up until the fares increased about 30 per cent above the 1918 level. With further increases in fare, however, the riding habit has generally decreased.

9. In all the cities served by rapid transit except Boston, which for reasons already stated is not strictly comparable with the other cities, the riding habit has increased faster than the service given, whereas in every case where cities are served with street cars and buses only, the riding has not kept pace with the service offered.

10. In the cities served by surface transit only, the demand for rapid transit service has been met by the use of the automobile and the riding habit of the surface lines reduced thereby, for, while rapid transit lines serve to create short haul riding on surface lines, automobiles do not.

11. In cities depending only on surface transportation, when buses have augmented the street car, the result has been that the former riding has been divided between the two types, with little, if any, addition to the total.



The easy chairs in the new parlor car, shown at the left, are finished in blue plush. Richness with simplicity is the note struck by the North Shore line in the new diners, shown at the right

# More New Cars for North Shore Line

TWO additional dining cars and one parlor-observation car, ordered by the Chicago, North Shore & Milwaukee Railroad from the Pullman Car & Manufacturing Corporation, have been delivered and are now in regular service between Chicago and Milwaukee. Altogether, eighteen new all-steel cars have been placed in high-speed passenger service by the North Shore on its main line this year. Besides the three cars just mentioned, fifteen passenger motor cars embracing the latest devices for the comfort and safety of the passengers, including the new easy chair type seats upholstered in gray Byzantine plush, were delivered by the same company recently.

The three cars just placed in service are the last word in travel luxury. The diners, seating 24 persons each, are finished in buff inside with walnut panels and have ornamental sidelights. Their elegance of finish is emphasized by the absence of decorations, a beveled mirror on the wall adjoining the kitchen being the only embellishment.

The parlor-observation car has seventeen of the latest type revolving easy chairs finished in light blue frieze plush. The interior is finished entirely in walnut. The carpeting in both the parlor-observation car and the diners is in black and gold, with felt padding underneath.

New equipment costing over $900,000 has been placed in service by the North Shore line during 1928.

# Wheeling Traction Company Spreads Holiday Spirit

WITH the view of aiding merchants and post office employees by inducing the public to shop and mail early, as well as to spread the spirit of the holiday season, the Wheeling Traction Company, Wheeling, W. Va., has placed a "Christmas Car" in operation over the various lines in the city. Painted in the traditional Christmas colors, red and green, brilliantly illuminated at night, and with the slogans "Shop Early," "Mail Early" and "Ride the Trolleys" displayed in gold lettering along the sides, the car presents a very attractive appearance, and has been the object of much favorable comment. Blazoned along the letterboard at the top of the car is the legend "Merry Christmas and Happy New Year." The front dash carries the suggestion that "Early Buyers Get the Best." The rear dash carries the injunction, "Mail Early, Direct with Care." In addition to being operated in Wheeling the car will make appearances in Moundsville and Bellaire, which are also served by the Wheeling Traction Company.




"Christmas Car" of the Wheeling Traction Company



The smaller motor coaches are well adapted for operation in the heavy downtown traffic of Detroit

# De Luxe Bus Lines

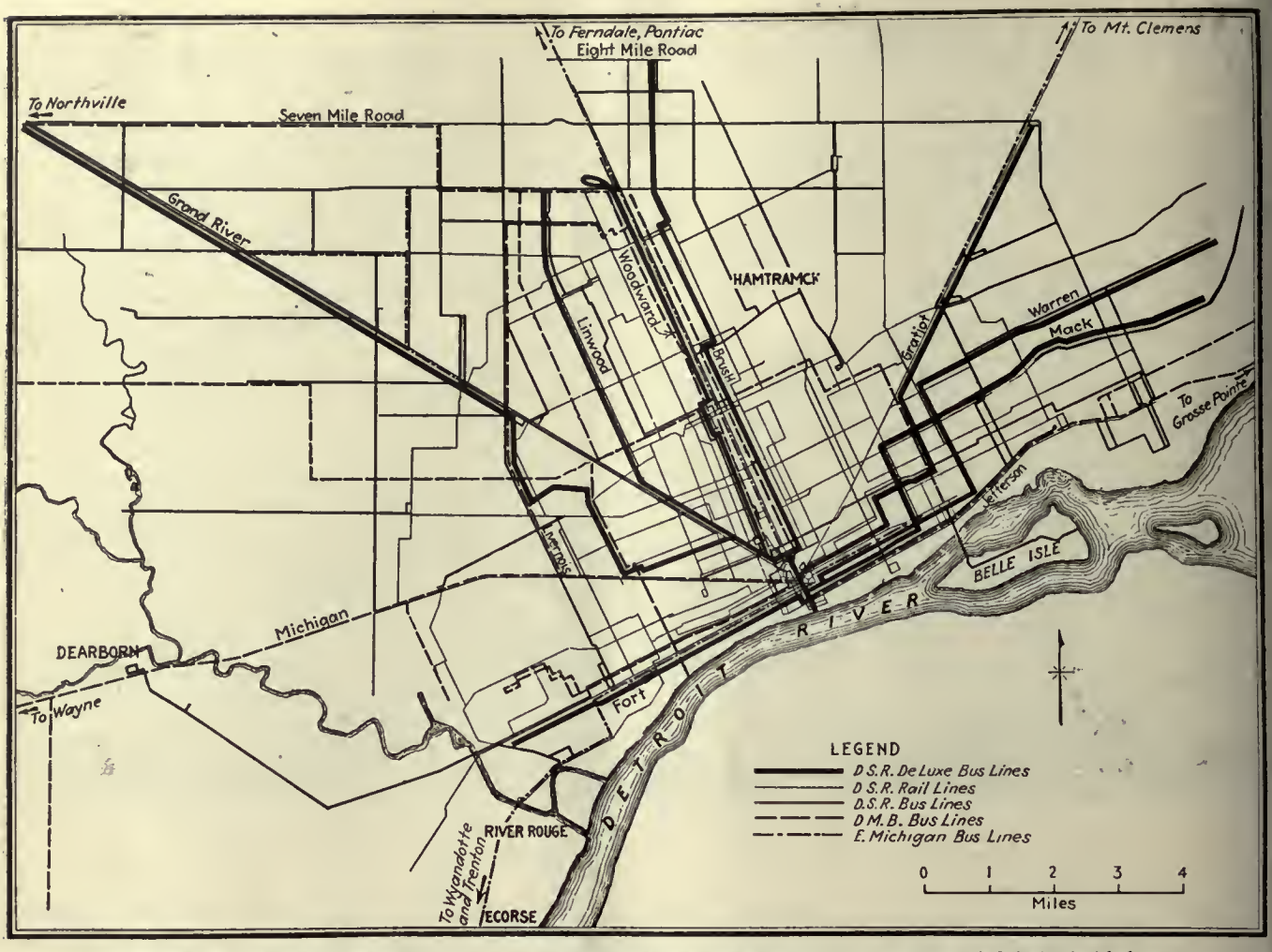
## Now Serve Detroit

**Four of six routes have been started and 160 parlor-type coaches ordered to render service replacing that formerly offered by the jitneys**

UNUSUAL, indeed, was the step taken by the Department of Street Railways of Detroit, when it decided to establish several de luxe bus routes to serve the residents who previously had used jitneys. The railway has decided not only to serve the four principal routes over which the jitneys formerly operated, but also to extend other routes into new sections of the city. A total of 160 small-capacity parlor coaches have been ordered for use in this service. Of this number, 120 are Grahams and 40 are Yellows. Aside from the magnitude of this venture into a new field, the program is of importance from a co-ordination standpoint. The jitneys proved to be serious competitors of the Department of Street Railways, and their removal from the streets and the substitution of a similar service by the electric railway should eliminate several difficulties. While most of the de luxe buses will travel over streets also served by street cars and buses, they will give essentially a different class of ride and will have as customers the former patrons of the jitneys.

### Public Willing to Pay Extra Fare

The Department of Street Railways on Nov. 25 inaugurated the first of the lines which have been definitely decided upon. This first line extends over Woodward Avenue from Palmer Woods, its outer terminus, to the downtown section of Detroit, operating part of the way over Cass and Second Avenues. The fares charged are comparable to those of the former jitneys: 10 cents from downtown to Grand Boulevard, 15 cents from down-




**Of the nine de luxe bus routes shown on the map, four have been established, two have been definitely decided upon and three have merely been proposed**

town to Highland Park, and 20 cents from downtown to the Six Mile Road. According to General Manager Del A. Smith, the line is meeting with favorable and immediate response from the public, proving conclusively that they are willing to pay the graduated fares of 10, 15 and 20 cents for this type of service. Because the service proved so popular on Woodward Avenue, the original eighteen coaches placed in service could not carry the full load and the company had to increase the number of buses on this route.

On Dec. 1 operation was started on the Grand River line, the second of the six routes. The number of buses was increased as they were delivered from the manufacturers. This particular line leaves the downtown section by way of Grand River Avenue, but branches for part of the route passing over Ash Street, West Grand Boulevard, Milford, Beechwood and Woodside Avenues, again joining Grand River Avenue at a point south of Livernois Avenue. This increases the distance by ¾ mile, but it is believed that better time is possible because of the lighter traffic encountered.

Since the starting of the Woodward Avenue and Grand River Avenue lines, two others have been established, one on Jefferson Avenue and another on Mack Avenue. The outer extremity of the Jefferson line is at Wayburn Avenue. The Mack Avenue route leaves the downtown section by way of Congress Street, goes north on Elliott Avenue and then out Mack Avenue. In addition to the four routes established, two others have been definitely decided upon, making a total of six routes. These two are the Fort Street and Linwood Avenue lines. The Fort Street line will terminate at Woodmere Cemetery. The Linwood Avenue line will leave the downtown section by way of Grand River Avenue and extend out Linwood Avenue to the Six Mile Road.

Three other routes have been proposed but no decision has been made on them as yet. The three routes are: Out Brush Street and Oakland Avenue to the Eight Mile Road; from Gratiot Avenue and the Seven Mile Road to Gratiot and East Grand Boulevard, thence downtown via the Boulevard, Verner Highway, McDougall Avenue and Macomb Street; out Lafayette Avenue East, Van Dyke Avenue and Warren Avenue. A line to Windsor, Ontario, may be considered later.

Due to the zoning arrangement, inbound buses will use the pay-as-you-enter system and the outbound vehicles the pay-as-you-leave. No interchange of transfers is permitted, either between the various de luxe lines or between the de luxe lines and the street cars or regular buses of the municipal system. Officials of the Department of Street Railways are considering the issuance of pass cards to be purchased by patrons and to be good for a certain number of rides, the card to be punched by the bus operator for each ride. Printed schedules will be distributed to the patrons as soon as the de luxe lines are completely established.

The buses ordered include 120 six-cylinder, 15-passenger Grahams and 40 eight-cylinder, 17-passenger,

model W Yellow parlor cars. The added equipment will be paid for on a rental basis, the rate being 20 cents a mile for the first four months, and 11½ cents a mile thereafter. The Department of Street Railways guarantees a minimum of 100 miles a day and has the option of returning the vehicles at the end of four months. At the end of this period, payment can be completed either on the rental basis or it can be paid in full at any time.

The Graham Brothers parlor coach has many refinements to add to the comfort of the passengers. The seats are upholstered in Spanish leather and have deep spring bases and air cushions. The bus seats fifteen passengers, exclusive of the driver, so that plenty of room is provided. There are three double seats on the left side of the bus and three single seats on the right side. Four more seats are located at the rear and one over each wheel housing.

The bus is heated by a fan blower system. Ventilation facilities include an electric fan opposite the door, ventilators in the cowl and roof, and a sloping one-piece windshield which has V-type ventilating wings at each side. Among the safety features are the Lockheed hydraulic four-wheel internal expanding brakes, a hand brake which operates on the propeller shaft, an emergency door at the rear of the coach and a non-skid entrance step.

A distinctive color combination is used to distinguish the de luxe buses from the others operated by the company. The body is finished in two tones of cardinal red and the top in beige. The wheels are red, in contrast to the fenders and body base of black. Black and gold stripes give a finished appearance to the exterior. The interiors are trimmed with Spanish leather to correspond to the upholstery of the seats. All windows are of plate glass and are equipped with roller anti-rattlers both inside and out.

The flooring which is of oak is laid crosswise and is covered with linoleum. The usual push-button switches of the stop signal system are replaced by a cord atached to a buzzer. The interior is illuminated by 6-cp. flush-type dome lights. A suggestion of the Pullman is given by the mirrors set in the window posts. The buses are equipped with six-cylinder motors and have a four-speed transmission. The nut-and-lever type of steering gear is used, with varying ratios to make the driving easy.

The 40 Yellow coaches ordered are the 17-passenger, type W parlor coach, especially designed for de luxe service. This type is powered by the Cadillac eight-cylinder, V-type engine, modified to meet the requirements of motor coach service. Other distinctive points of this coach are the four-wheel, four-segment service brakes; the external, contracting emergency hand brake,



**The first of the de luxe bus lines was started on Woodward Avenue on Nov. 25**



The Graham parlor coaches are designed to give the utmost in comfort to the passengers

working on two gun iron drums on either side of the propeller shaft bearings; the underslung, worm-driven rear axle of over-size capacity; unusually long and wide springs, with an improved type of suspension for the front springs; a four-speed transmission; and steering gear designed for ease of control. The seats in this coach are arranged in pairs on the left side and singly on the right side. They are upholstered in leather and have deep spring cushions.

Only the most courteous and dependable drivers of the 500 now employed by the Department of Street Railways are being picked to operate the de luxe buses. The driver's uniform chosen for this service is of a dark cardinal red shade with a French style fatigue cap to match.

### Status of Jitneys Contested for Six Years

Jitney operation on the streets of Detroit, conducted for the past six years under the protection of a series of injunctions, was terminated by the Police Department acting under a decision of the Michigan Supreme Court. The jitney ordinance was signed by the Mayor of Detroit on May 29, 1922, and it became effective the following October. On Oct. 24 of this year the Michigan Supreme Court in a majority opinion, upheld the validity of the ordinance and indicated that further legislation aimed to delay enforcement would not be tolerated. The ordinance prohibited the operation of jitneys on Fort Street East and West, Michigan Avenue, Grand River Avenue, Woodward Avenue, Jefferson Avenue, Cass Avenue, John R Street and the parks and boulevards. The Supreme Court's opinion was handed down on the city's motion to dismiss the bill of complaint of the Red Star and the Blue Ribbon Jitney Drivers' associations. The court




Forty type W Yellow parlor coaches, seating 17 passengers, were ordered for the new de luxe service

also took up the city's appeal, asking for a writ of mandamus to compel the circuit judge to dismiss his injunction under the protection of which the jitneys were operating. The court opinion stated that with the dismissal of the bill, the injunction based upon the bill goes down with it. The order dismissing the writ was signed by the circuit judge when presented by the corporation counsel, leaving the city free to enforce the ordinance.

Because they had taken steps to obey the ordinance, 30 jitneys were granted permits early in October. These continued to run on Hamilton Avenue, from Library Square downtown to the southern limits of Highland Park, following the ousting of the others on Oct. 24. The route paralleled to a large extent one of the D.S.R. trolley lines. Recent steps, however, were taken by the Mayor of Detroit to banish jitney service of any kind. In answer to the proposal, the City Council recently passed an ordinance to prohibit the operation of so-called jitneys on the streets, avenues, boulevards and public places of Detroit. This measure provides against the operation of jitneys on any city




A total of 160 buses were ordered, 120 of which are to be 15-passenger Grahams of the type shown above



The attractive interior of the type W Yellow parlor coach gives an atmosphere of refinement

street or any thoroughfare mentioned in the original ordinance.

At the time the Supreme Court decision was put into effect, about 1,000 jitneys were being operated on the city streets. Only about 500 of these were involved in the six-year legal proceedings. The others were newcomers, usually referred to as "wild cats," that began to appear during June and July of the present year. The general scheme was to follow a route that led into some important downtown point where regular loading points with starters were established. Starters were also maintained at the outlying terminals to control the drivers, establish spacings, and exercise general supervision. Parking space was available at the outlying terminals, but downtown the jitneys would often be making a circuit on near-by streets and waiting their turn to get into the stand and pick-up passengers.

Once the jitneys were removed, additional service was given by the Department of Street Railways. It rented 40 trolleys from the Eastern Michigan Railways and 30 cars and trailers from the Cleveland Railway. Service was augmented particularly on the Woodward, Jefferson, Grand River and Fort Street lines, where the majority of jitneys operated.

## British Tramway Traffic Increases

STATISTICS of the tramway undertakings in Great Britain are published each year by the Ministry of Transport. These figures from tramway companies for the year ended Dec. 31, 1927, and for the municipal lines for the year ended March 31, 1928, have just been issued. They show 233 systems, of which 167 are owned by the municipalities and 66 by private companies. The number of miles of route was 2,514, a decrease of 40 miles compared with the previous year.

The total capital expenditure at the end of the period mentioned was £99,913,760, an increase of £1,303,255, as compared with the previous year. The revenue from operation during the year was £27,751,504 and the operating expenses £21,943,147. The net income was £5,808,357.

The passengers carried during the year were 4,705,842,932, an increase of 5.51 per cent as compared with the previous year. There was also an increase of 4.70 per cent in car-miles run, the figure for the year just past being 396,554,545.

The report also shows that there were eleven trackless trolley lines, the length of route operated amounting to 111 miles, an increase of 24 miles. The number of passengers carried on these lines was 80,112,970.

## Diagonal Versus Parallel Parking

AN INTERESTING analysis of the effect on street traffic of diagonal and parallel parking has recently been made in the city of Houston, Tex., by the Beeler Organization. The report relates to Main Street, the principal business thoroughfare of Houston, and in a sense is a supplement to the traffic report on that city published in abstract in the issue of ELECTRIC RAILWAY JOURNAL for Dec. 8.

Main Street is 60 ft. wide from curb to curb, and at the present time, diagonal parking is followed. With this kind of parking, a maximum of 378 cars can be accommodated in the nine blocks of the business district. With parallel parking, a total of only 288 cars could be accommodated in the same nine blocks. The figures in each case represent the maximum when all of the curb length was used, but normal restrictions on parking in front of fire hydrants, at the entrances to public buildings and some stores, and some obstructions due to building operations will reduce these totals to about 284 and 216, respectively. If the parked cars were changed each hour during the ten hours of the day, 680 additional cars could be accommodated daily by the diagonal system of parking, but this number represents only 1.3 per cent of the 51,824 passenger cars in the city.

With diagonal parking at 45 deg. the roadway left open to traffic is reduced 30 ft., which is theoretically sufficient for three streams of traffic, but owing to the varying lengths of vehicles and the need for drivers to be on the lookout for cars backing out of their stalls, moving traffic is practically limited to two streams.

With parallel parking, on the other hand, 46 ft. of clear roadway would be open, allowing four traffic streams free to travel at a brisk rate between the comparatively smooth lines of the parked vehicles. Parking at an angle of 30 deg. at the curb reduces the standing capacity to about that of parallel parking, and reduces the effective roadway to almost the same extent as the 45-deg. angle parking.

It will be noted that the 30 per cent additional capacity provided by the 45-deg. angle parking requires a street area practically double that required by parallel parking. Parallel parking requires 14 ft. of street width, while angle parking requires 30 ft. In other words, the additional 68-car capacity obtained from diagonal parking consumes a street area 16 ft. wide throughout the length of the nine blocks, which if devoted to moving traffic would provide space for two additional traffic streams with an hourly capacity of approximately 2,000 cars. The volume of traffic which can enter the Main Street business section is therefore cut approximately in half by angle parking. Angle parking also increases the hazard of driving, reduces freedom of movement and makes it impracticable to operate an express bus line on Main Street, as has been proposed. Such a line, it is estimated, would carry approximately 2,685,000 people in and out of the Main Street business section during the first year of operation.

## Need for Increasing the Capacity of the Railway Caused the Electrification of This Suburban Line in India



An electric train of four coaches on the Bombay, Baroda & Central India Railway



Overhead construction over the tracks at Bandra station



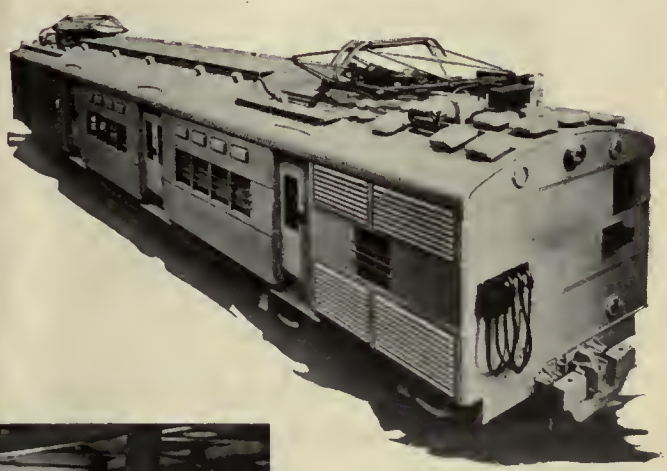
The overhead catenaries with the substation at Kandivliee

# Bombay Electrifies Its Suburban Service

**Need for increased capacity was determining factor in electrification of 23-mile section of Bombay, Baroda & Central India Railway. Multi-side-door cars are used. Stations remodeled and signals installed**

ELECTRIFICATION of suburban service on the Bombay division of the Bombay, Baroda & Central India Railway is one of the recent transportation developments in the Orient. Business on this division has grown at a very rapid rate during the past twenty years. No record is available to show the number of passengers carried on this division prior to 1888, but in that year the total was 10,000,000. This figure is useful in reviewing the statistics of more recent years. In 1914, 24,000,000 passengers were carried; in 1918, 30,000,000, and for 1927 the figure has been put at 38,000,000 passengers. During a boom in 1922, when rents in the city of Bombay rose to an excessive level, no less than 45,000,000 people were carried, causing a severe test on the capacity of the division which at that time had no modern equipment for the acceleration of train movements. It has been this continuous increase in demand for transportation which made necessary the conversion of the road from steam to electric traction. Opportunity was taken of this change to make other permanent improvements, including a remodeling of most of the local stations, installation of signals over the entire suburban section of 23 miles, and the construction of a number of over-bridges to do away with grade crossings.

According to the original plan, it was hoped that electrification would have been completed in 1926, but the opening did not take place until early in 1928. The power required is secured from the hydro-electric stations in the Western Ghats, some 100 miles from Bombay. It is transmitted to Bombay as three-phase alternating current at 110,000 volts and 50 cycles, and is first transformed at the substations to 22,000 volts and then converted to direct current at the trolley voltage of 1,500 volts. The converters in the three substations are controlled from one point. The 1,500-volt direct current is distributed to the cars by two overhead wires with catenary suspension.



Motor coach on the Bombay, Baroda & Central India Railway



Interior view of Bandra power station

The cars are of steel and entirely new. They were supplied by the English firm of Cammell Laird & Company. The design allows for free circulation of air between the inner lining and the outer shell of the car. They are equipped with wide sliding doors of aluminum alloy construction. The electrical equipment was supplied by the British Thomson-Houston Company, Ltd., each motor car being equipped with four 750-volt ventilated interpole motors,



Interior view, showing first-class compartment

which are permanently connected in two groups of two motors in series.

Inside, the cars are lined with teakwood throughout. The seats of the third-class coaches are also of teak. In the first-class coaches upholstered seats are used. Altogether there are 160 cars which are in service coupled in units of four, one motor coach and three trailers. These units can be operated separately or coupled to form full trains of eight cars. The seating capacity of an eight-car train is approximately 1,000 persons and is 33 per cent greater than the capacity of the previous steam trains. With the equipment of four motors, having a combined rating of 1,100 hp., on each motor car, a fully loaded train unit of three trailers and one motor car can be accelerated at 1 m.p.h.p.s. The control equipment provides for automatic acceleration. The cars are 68 ft. in length and 12 ft. wide, as compared with a width of 10 to 10½ ft for the steam cars.

## Railway Electrification Proceeding in Morocco

PROGRESS in railway electrification is being made rapidly in Morocco, where water power is plentiful and all coal has to be imported. Already, the Morocco Railway Company has about 200 km. (130 miles) of track equipped with electric power. The entire system in operation by electricity and steam comprises about 583 km. (265 miles), with projected extensions of nearly the same length. The railway is owned by a French company with largely the same interests as control some of the principal trunk line railroads in France.

At present the lines are receiving a considerable portion of their power from steam stations, but a large hydro-electric station is being built on the Oum-er-Rebia River, the principal river in western Morocco.

Direct current at 2,000 volts is being used, and ten locomotives and the same number of motor cars have been purchased. The electric locomotives are 38 ft. 9 in. over all, weigh 160,000 lb. each and have an hourly rating of 1,340 hp. Each motor car is equipped with four 140-hp. motors and is capable of hauling two trailers. Further particulars are given in a paper contained in the May-June Proceedings of the French Institution of Civil Engineers. It was contributed by H. Parodi, consulting engineer of the Morocco Railway Company and of the Orleans Railway Company of France.

# Oldest Railway in England Is Electrically Equipped

### Built as a horse car line in 1804, it celebrates its 124th birthday by adopting electric power and buying new cars

THE oldest railway now in operation in Great Britain, possibly in the world, is a 6-mile line between Swansea and Oystermouth in Wales. It is popularly known as the Mumbles Railway. This road was authorized by an act of Parliament dated June 29, 1804, and completed shortly after. Several railway lines were incorporated and constructed in England before this date, but all of them have either been abandoned or absorbed into larger systems. But for the past 124 years the Mumbles Railway has retained its individuality.

As first constructed, the rails were of angle iron in 3-ft. lengths, set into granite blocks, spaced 3 ft. apart. As the rail was flanged, there were no flanges on the wheels. The first change was to rails weighing 28 lb. to the yard, then to 56-lb. rails, and then to the present standard of 85-lb. rails.

Originally the road was built to haul iron ore and limestone from some mines and quarries that were at the end of the line, but in 1816 passenger cars were added.



Britain's oldest railway has just adopted this car

The mines and quarries were exhausted and abandoned many years ago and the principal business of the road now is passenger transportation.

Up to 1877 all cars, including the freight cars, were hauled by horses. In 1877, however, the motive power was changed to steam. With steam, the type of passenger cars retained in service was similar to those ordinarily used for horse-car service elsewhere at that time; that is to say, they were light four-wheel, double-deck cars with the upper deck open.

This year, steam has been abandoned in favor of electric power. The new cars are of the British double-deck, double-truck type, with a capacity for 48 passengers on the lower deck and 58 on the upper deck. A special feature of car design was introduced, however, because of the unusual physical features of the route, which has the sea on one side and a highway on the other throughout its entire length. The result is that as the cars have a stub terminal at each end, both entrance and exit are on one side of the car only, with no doors on the other side.



The clinic is well supplied with apparatus and instruments needed in surgical practice

# Interborough Cares for Medical and Surgical Needs of Employees

WORK done by the medical department is a feature of the welfare activities of the Interborough Rapid Transit Company. The headquarters of this department is on the ground floor of the company's new shop and car yard at 147th Street and Seventh Avenue. The medical department takes care of the medical and surgical needs of 16,000 employees, as well as those of their wives and children. A record is kept of the cases treated, and in 1927 treatments were given to 3,555 patients. The average number of treatments per patient was slightly less than six.

At the 147th Street carhouse the department has a clinic with three examining rooms, sterilizer and other equipment for operations, a number of therapy aids in the way of electrical machines, etc. One of the company's full time physicians, as well as nurses, is always in attendance or within quick call. Here are all the remedies and appliances needed for prompt treatment in case of accident in the shop. There is also another clinic at the company's shops and car yard at Lexington Avenue and 98th Street.

All extensive surgical work is conducted at the Post Graduate Hospital at Twentieth Street and Second Avenue. The company has an arrangement with this hospital for accommodations, and Dr. John J. Moorhead, chief surgeon of the company and head of its medical department, is also professor of surgery at the Post-Graduate Hospital and Medical School. A male ward of ten beds is maintained at this hospital for the benefit of the male employees of the company. After a company patient at this hospital is able to leave, he is treated at one of the company's clinics.

The medical department includes six full-time physicians and surgeons besides Dr. Moorhead, who performs the operations at the Post-Graduate Hospital. Besides these physicians, the company has an arrangement with 28 others who give part time. Their offices are scattered about the territory in which the employees live. They

FORM L-81

| OFFICE CALLS | Employee's Surgical Treatment Card | HOUSE CALLS |
|---|---|---|
| 1 2 3 4 | Name _____ | 1 2 3 4 |
| 5 6 7 8 | Address _____ | 5 6 7 8 |
| 9 10 11 | Badge No. _____ or Pass No. _____ | 9 10 11 |
| 12 13 14 | Treated by _____ | 12 13 14 |
| 15 16 17 | At _____ | 15 16 17 |
| 18 19 20 | Diagnosis _____ | 18 19 20 |
| 21 22 23 | _____ | 21 22 23 |
| 24 25 26 | Began treatment _____ | 24 25 26 |
| 27 28 29 | Discharged _____ | 27 28 29 |
| 30 31 | Record Book _____ Folder _____ | 30 31 |
| | _____ (over) | |

| | | |
|---|---|---|
| Name | Badge | Occupation |
| Address | Co. | Shop |
| Date of accident | Began Treatment | |
| Cause of accident | | |
| Diagnosis | | |
| X-Ray | | |
| Treatment notes | | |
| | | |
| | | |
| | | |
| | | |
| Treated by | | |

Two forms found convenient for recording data about patients; at left is that used by the local doctor, at right that used in the clinic

may be called through the medical department to attend or give medical advice to any employee.

When a case of sickness develops at home and is reported to the department, the procedure is as follows: A visit is immediately made to the home of the employee by the company's head nurse or one of her assistants. This nurse has authority to care for the medical and surgical needs of the patient by sending him to a hospital or by calling in a physician. She also has authority to see that the family is cared for during the absence of the patient if it should be either the father or the mother of dependent children. She also has authority to advance a loan for any necessary expenses. If the injury or sickness develops while the man is at work, he is sent to the clinic by the foreman in charge.

Records are kept of each case treated. Two of the cards used for this purpose are published. The first is known as the doctor's office record, and covers the cases treated in any outside office. The other is used when the case is treated in one of the clinics. So long as patients are under treatment these cards are kept in a file known as the active list. This list usually includes about 500 cards.

In another record all cases are classified by nature of trouble. From this record the accompanying table has been prepared.

TABLE SHOWING CASES TREATED BY I. R. T. MEDICAL DEPARTMENT IN ONE YEAR

| Diagnosis | Number of Cases | Average Number of Treatments | Average Time Lost, in Days |
|---|---|---|---|
| Lacerations | 1,039 | 5 | 1 |
| Contusions | 543 | 3 | 2 |
| Medical cases | 362 | 4 | 8 |
| Sprains | 235 | 3 | 1 |
| No evidence of injury | 235 | 2 | 1 |
| Infections | 204 | 7 | 3 |
| Burns | 175 | 8 | 6 |
| Eye cases | 91 | 2 | 1 |
| Punctured wound | 86 | 3 | 5 |
| Back injury | 67 | 3 | 4 |
| Hernias | 52 | 8 | 30 |
| Foreign bodies | 39 | 2 | 1 |
| Traumatic amputation | 6 | 13 | 17 |
| Fractures | 121 | 15 | 40 |
| Total or average | 3,255 | 6 | .. |

After an employee has been on the sick list, he must pass a physical examination before returning to work, to determine whether he is again physically fit for his job. Foremen, instructors, nurses and others who are brought into touch with the employees have authority to call the attention of any employee to the need for a physical examination. Other than this there is no definite period for physical re-examinations of employees in service. The men are encouraged, however, to take such examinations at any time they feel it necessary, by being assured that no one will lose his position with the company because of physical incapacity in any particular. If an employee cannot be kept at his existing job for physical reasons, he will be assigned to another. The company always has enough openings as storekeepers, watchmen, or for work at some passenger station, to take care of any trainman or other employee no longer fitted for his existing work. If an employee has been with the company for 25 years or more he is entitled to a pension.

A service of the medical department not heretofore mentioned is the contribution frequently to the employees' magazine, the *I.R.T. News,* of a column on health hints. This column is conducted by Dr. Henry Green, one of the company's surgeons, and in this column he answers questions on medical topics sent in by mail, unless a personal answer is requested by the correspondent. He also contributes to the *I.R.T. News* from time to time, articles on such practical topics as causes for common ailments, remedies for and prevention of them.

# Grade Separation Project in Evanston Progressing

STEADY progress is being made on the elevation of the Chicago Rapid Transit Lines' right-of-way between Church and Isabella Streets, Evanston, Ill., on the north side division. Construction of the temporary trestle for the north-bound track was completed the first week in October and north-bound traffic is now being routed over this structure. Work has been started on the trestle for the south-bound track and when this is completed all trains will be operated over the temporary structures. It was expected that both trestles would be completed by the end of the year.

When the trestles are finished work will proceed on



**Looking south from Hamlin Avenue, Evanston, the regular surface platforms soon to be superseded can be seen. The pile driver is in position for driving the first trestle**

the permanent construction, which includes the placing of concrete walls, building bridges over street crossings, filling in the permanent embankment, erecting new stations and laying tracks.

The work of driving the trestle is being done in sections to give a better balance to the track and trestle work. Temporary tracks carry the traffic on the sections where the construction work is in progress and temporary island platforms are used for loading. Three of these were built between the two trestles, at Foster, Noyes and Central Streets, the present station locations. These platforms, constructed simultaneously with the north-bound trestle, are of sufficient length to accommodate eight-car trains. For surface operation, new temporary platforms for south-bound traffic have been constructed at Foster and Noyes Streets and existing station buildings moved to them. At Central Street station, the platforms and tracks were shifted west to make room for driving the first trestle. In the accompanying illustrations are shown the various steps in constructing the platforms and trestles.

The track layout has provided at all times for two operating tracks and one construction track. These, supplemented by crossovers where needed, have made it possible to conduct the regular transportation business and the construction work on the same right-of-way without the slightest delay to either. North-bound trains were switched to the old south-bound track, while



The south-bound trestle is going up rapidly, the pile driver shown in the background being kept busy from dawn to dusk



Portable block and tackle used to hoist the cross sills or caps in place atop the piles



A gasoline-driven traveling crane unloads the heavy stringers directly from the flat-car to their ultimate location on top of the caps

south-bound traffic was switched to a temporary track on the west side of the right-of-way through the section where construction work was progressing.

The two trestles are being constructed on a minimum of 17 ft. centers to allow clearance for a center line of poles supporting the overhead. At stations these centers are increased to permit room for the island platforms. Maximum curvature on the trestles is 6 deg., equivalent to a No. 10 turnout.

### Temporary Track Reduced to a Minimum

Owing to the track and station conditions in Evanston, the north-bound trestle has been located on the east side of the right-of-way, 8 ft. from the east right-of-way line. The second trestle is being driven from the surface track used for north-bound traffic under the temporary operating scheme. South-bound trains operate on the surface over a track formed by utilizing an existing freight spur from University Place to Hamlin Avenue, the Edinger coal track between Noyes and Colfax Streets, and a new piece of temporary track laid between Hamlin and Simpson Streets. These arrangements have served to reduce temporary track construction to a minimum.

In carrying out the work outlined, certain changes had to be made in the operation of the North Shore trains into Evanston. The use of the tracks in the terminal at Church Street has been discontinued. Passenger operation consists only of half hourly service in and out for three hours each morning and evening; consequently it has been possible to make use of a temporary loading platform built along the east yard track, west of the main line which extends north from Church Street. Freight business is being handled at the Chicago, Milwaukee, St. Paul & Pacific freight house at Church Street. At Foster and Noyes Streets the North Shore passengers are using the Rapid Transit platforms.



The north-bound trestle to the right has been completed; the south-bound trestle is just being started



Temporary platform at Central Street station erected to permit unloading passengers from new north-bound trestle



Central Street elevated structure where north-bound traffic is now being handled



**This locomotive, oil tank car, sanding car and crew are used by the Pacific Electric Railway in oiling roadbeds**

# Weed Fighting in California

**Extended trials with hand elimination, burning and chemical treatment have led to spraying by crude oil. This is the method now standard**

SINCE rails were first laid, the weed nuisance has been more or less of a problem to maintenance-of-way forces of all railways operating over private right-of way. In Southern California, the problem has been especially serious, because of the readiness with which all plants grow. The Pacific Electric has run the gauntlet of experiences in fighting weeds on its rights-of-way.

Not so many years ago large crews of men cleared the rights-of-way by hand. This process was an expensive one, and the burning method of elimination, which came into popular favor some years ago, was tried out. While this process was satisfactory, inasmuch as it dealt a death blow to the growth, it created a fire hazard that was objectionable.

Another plan of dealing with the weeds, is the use of chemicals. This method provides for spraying rights-of-way with some chemical like sodium arsenite, diluted with water, according to the hardiness and thickness of the vegetation to be destroyed. This process has proved far more effective than any other tried up to the time of its introduction, and it still remains the most economical weed destroyer where the problem is solely a matter of destroying vegetation. However, there are other angles to the problem which suggested the wisdom of using crude oil as a weed executor. The theory underlying this plan and found to work out in actual practice is that the oiling process serves four purposes all of which are useful. They are (1) it kills weeds; (2) it settles dust; (3) it improves the appearance of the rights-of-way and (4) it removes the glare from a rock ballasted and other ray throwing roadbed.

The method of applying the oil to the roadbed was developed by the engineering department of the Pacific Electric. It is similar to that used in the application of the chemical weed killer. A regulation tank car is converted into an "oiling car" through the addition of a slotted pipe spray connected to the outlet of the tank. This slotted pipe extends from its connection with the bottom tank outlet to either side of the roadbed proper, and is so constructed that extensions may be brought into use for the spraying of extra wide strips of rights-of-way.

The spraying car is also equipped with a 2-in. centrifugal pump connected to a 5-hp. d.c. motor with a hose connection to the tank proper. There are also two lengths of 1-in. hose about 25 ft. in length with a nozzle on each hose through which the pump forces oil. The nozzles atomize the flow so that it is a simple matter for a man to hold the hose and spread the oil evenly. This latter equipment is called into use only when extra wide strips of rights-of-way are to be sprayed, or where obstructions in the form of posts, poles or fences make it dif-



**A "close-up" of the Diesel oil spray**

ficult to use the regular extensions to the roadbed spray.

Immediately following the oil car is a sander, which is a converted flat car, being boxed with sides 18 in. high. There are four spouts, over which is placed a fine screen, into which men placed on the car shovel sand. In this way the greasing effect on the surface of the rail caused by the oiler is neutralized, and the track is left in safe operating condition.

When spraying with regular equipment under average conditions the oiler moves at a speed of 8 to 10 m.p.h., spreading approximately 2,000 gal. of oil per mile. When the hose sprays are used the speed of the train is of necessity slower, depending on the area to be sprayed and the many other local conditions encountered.

The oil used for this purpose, commonly known as Diesel oil, is a low grade distillate with the asphaltum removed, being of 24 deg. gravity.

The oil penetrates the ground very rapidly, to a depth of between 1½ and 2 in. within the first hour, and does not leave a gummy or sticky surface as might be surmised. The cost per barrel of Diesel oil at this writing varies between $1.08 and $1.10, f.o.b. the refinery.

### Cost Per Mile Reasonable

The cost of applying the average coat of oil is $40 per single-track mile. This figure includes the cost of the oil, and all operating expenses of equipment, labor and supervision. Where it is necessary to spray by hand, sections of the right-of-way too far distant from the regular equipment, the cost naturally runs higher, being estimated at about 0.2 of a cent per square foot.

Experience on the Pacific Electric Railway shows that best results are obtained through the periodical spraying of the roadbed. The oil is applied at intervals of six months until three coats have been applied. After that it is only necessary to repeat the process about once every two years, and then only with a light single coat. It is simply a matter of getting the ground "set for the killing" and then keeping it that way through occasional spraying.

After the three applications of oil, practically all seeds within the soil of the right-of-way have been killed and thereafter seeds that reach the right-of-way, because they do reach the interior of the soil, do not germinate, but lie dormant until they die. The oil application is effective against all species of weed growths. Particularly has it been "dynamite" against Bermuda grass, more commonly known as the hated "devil grass."

During the past summer season, extensive spraying operations were carried on. To date, 123.55 miles of single track roadbed and 1,153,000 sq.ft. of right-of-way have been treated with oil. The work is still in progress and will continue until the rainy season.

The Pacific Electric Railway has oil treated its San Bernardino, Long Beach and San Pedro lines, all major arteries, besides various strips on practically every line of the system. Oil also has been effectively used in the improving of private rights-of-way in the largely populated cities of Glendale, Long Beach and Culver City.

From any angle viewed, so far as the Pacific Electric is concerned, the oiling process is superior to previous methods. Ultimate cost will show a "smiling" credit on the ledger. Dust is pleasingly and permanently controlled. Roadbed is improved in appearance to the point where complaints have been entirely eliminated, and the glare strain on motormen's eyes is removed through the darkening effect of the oil application. The fourfold purpose which the oil serves, as compared with single benefits of the chemical process, places the oiling method in a class by itself so far as the treatment of the railway roadbed and right-of-way are concerned.

## Public Service Installs Noise Reduction Devices

ENGINEERS of the Public Service Co-ordinated Transport, Newark, N. J., have been experimenting for some time with various devices by which it is hoped to reduce materially the noise of street car operation. To damp the noise-producing vibration of the wheel, four holes have been bored through the web. Circular wooden blocks slightly larger than the hole are placed on both sides of the web and bolted together. Grooves have been cut around the gears and pinions and filled with lead to eliminate the grinding ring of the gears. Canvas strips have been placed between moving metal parts to reduce the scraping noises of metal in contact.



**Installing wooden disks to reduce wheel noises on cars of Public Service Co-ordinated Transport**

These devices have been installed on one car now in service on the Mount Prospect line in Newark. Preliminary tests indicate that the noise of operation has been reduced about 50 per cent. Other cars are being similarly equipped as they pass through the shops for their regular periodic overhauling. If further tests prove as successful as it is expected, all of the company's cars will be equipped with the new devices.

## New Englanders Consider New Cars

MORE than 300 members and guests attended the December meeting of the New England Street Railway Club, held at the Hotel Statler in Boston on Dec. 13. The program, arranged by R. B. Stearns, vice-president and general manager of the Eastern Massachusetts Street Railway, included an exhibition of two Birney cars, one a single-truck and the other a double-truck, in the morning, two addresses in the afternoon and a musical entertainment in the evening. The two speakers, Ross Schram of the Twin Coach Corporation, and C. O. Birney of Stone & Webster, Inc., described in detail the new automotive street cars manufactured by the Twin Coach Corporation and the St. Louis Car Company, respectively. W. E. Wood, president of the Virginia Electric & Power Company, gave a talk on the Coffin Award for 1928.

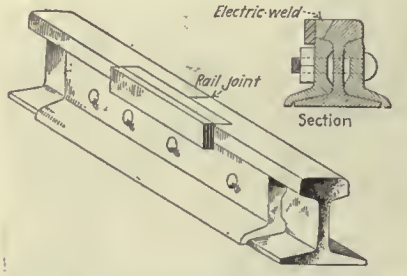
# Time and Labor Saving Ideas

## Inexpensive Welded Rail Joint*

By Louis T. Botto

*Superintendent Maintenance-of-Way Department, San Antonio Public Service Company, San Antonio, Tex.*

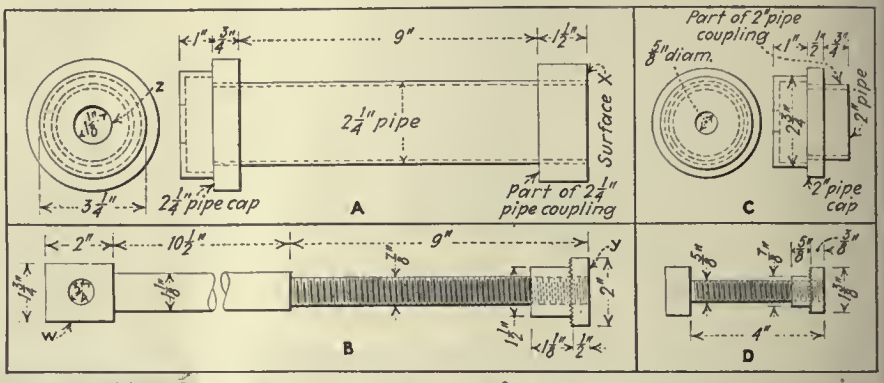
ON LINES of the San Antonio Public Service Company, San Antonio, Tex., in gravel ballast track that is not welded throughout, many bad joints have been reconditioned by a very inexpensive method of welding. The accompanying sketch shows the construction used. A part of the rail head at the joint is cut out on a bevel. A piece of boiler plate is then applied to the outside of the rail, and the space left by the portion that is cut out is filled in by welding. This forms a permanent joint between the angle bar, the rail and the plate. It has been found that this weld does not pull apart in service, and makes a very smooth joint.




**Details of welded rail joint used by the San Antonio Public Service Company**

## Simple Air Compressor Bearing Press

TROUBLE was experienced by the Richmond Railways, Inc., Staten Island, N. Y., in removing armature and pinion bearings of the Westinghouse DH-16 air compressors from their housings until Air Equipment Inspector E. Niksic designed a hand press to perform this work. Prior to the adoption of this tool it took a long time to remove the bearings from the housings, and often the bearings were unfit for further service after their removal. The tool referred to is shown in the accompanying sketches. Illustrations *A* and *B* show the parts of the press used for the removal of the main armature bearings; the other two show the parts of the press used for removing the pinion bearings. Both are similar so that a description of the design and use of one will suffice.




**These tools provide means for effecting a very substantial reduction in air compressor maintenance expense. Above, press for removing main armature bearing. Below, press for removing pinion bearing**

Referring to the main armature bearing press, this consists of two parts, *A* and *B*. Part *A* is made of a piece of 2¼-in. iron pipe 11¼ in. long. One end is fitted with a 2¼-in. pipe coupling 1½ in. long, and the other with a 2¼-in. pipe cap. The assembled parts are 12¼ in. long. The center of the pipe cap is drilled with a 1⅛-in. hole.

Part *B* is a round rod 19½ in. long fitted with a head 1¾x2x1¾ in. and drilled with a ¾-in. diameter hole. The rod is turned to 1⅛ in. diameter for a distance of 10½ in. from the bottom of the head. The remaining 9 in. is turned to ⅞ in. and threaded with a standard ⅞-in. thread. The end of this threaded portion is fitted with a 1½ in. diameter collar with a 2 in. diameter by ½ in. thick flange. The inner face of this flange has saw teeth to assure that it will grip the bearing during removal.

This tool is used as follows: Collar *Y* is removed and the rod *B* inserted into cylinder *A* through the hole *Z*. Then the rod *B* is passed through the bearing and the surface *X* placed against the bearing housing. Collar *Y* is then screwed onto the rod *B* until the saw teeth press against the end of the bearing. A lever rod is then placed in hole *W* and the screw is turned. The saw teeth in the collar grip the bearing tightly and prevent it from turning. Continued tightening of the screw gradually pulls the bearing from its housing and deposits it in the cylinder *A*.

## Sign Rack Saves Time of Car Crews*

By C. B. Hall

*Chief Clerk Mechanical Department Virginia Electric & Power Company, Norfolk, Va.*

A DASH SIGN rack erected in the car yard of the Virginia Electric & Power Company, Norfolk, Va., has proved a great time saver to car crews. The rack is of simple construction with partitions to separate the different dash signs carried by the

**Submitted in* Electric Railway Journal *Prize Contest.*

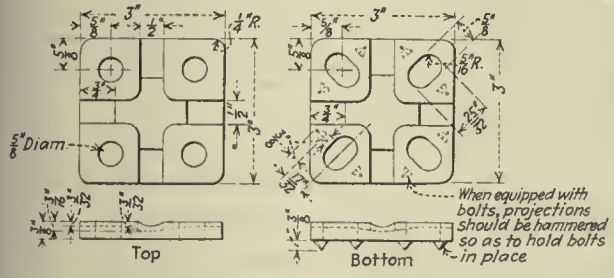


**Dash sign rack at the dispatcher's office of the Virginia Electric & Power Company**

cars. It is installed in the direct path of the operators when leaving the dispatcher's office for their respective cars. All that is necessary is to draw out the particular sign desired. Carhouse mechanics remove the signs from the cars at the close of the day's run, and return them to the proper sections in the rack.

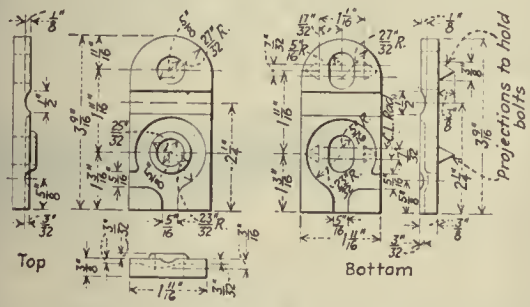
## Overhead Line Devices That Save Labor and Reduce Maintenance

ACCOMPANYING illustrations show seven types of overhead devices utilized by George Butterick, supervisor of lines for the Connecticut Company, New Haven, Conn., and which have proved of particular benefit in that company's line construction. The devices include three types of supporting brackets, two clamps and two types of switches.



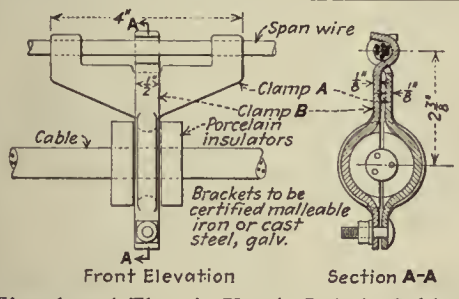

### Four Bolt Span and Backbone Clamp

This is used where a backbone is installed on the front side of the pole. It has resulted in a considerable saving both in labor and material for trolley curve work.



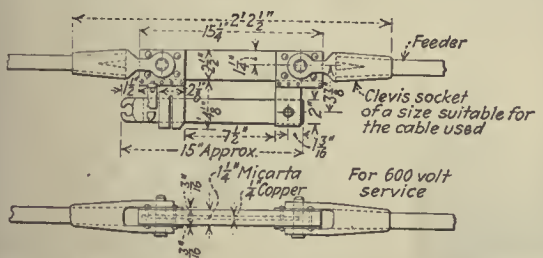

### Standard Clamp for Pull-Offs on Backbones

Used on curves, this does away with the necessity of a pull-off on backbone, thus saving thimble and serving of pull-off wires.



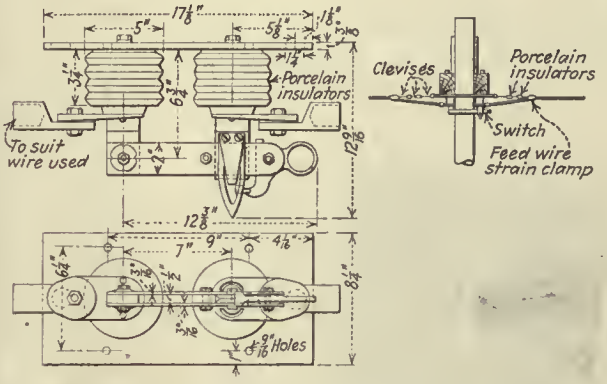

### No. 4 Signal and Electric Track Switch Cable Bracket

A convenient device for suspending signal and electric track switch cables on span wires or messenger wires in connection with automatic signals and electric track switches. It can be used also for suspending cables for traffic signals, street lights, etc.



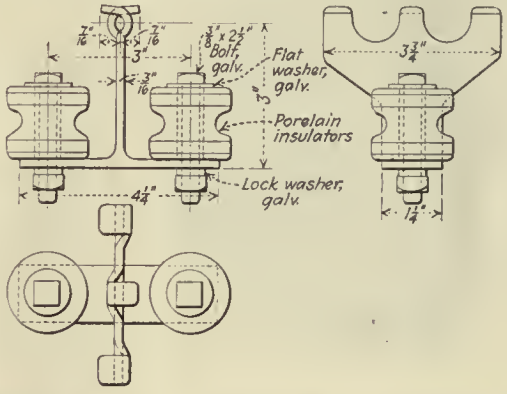

### Knife Switch for Feed Span Where Boxes Cannot Be Installed

This is used in feed spans for trolley service where city or municipal authorities prohibit the use of switch boxes on poles.



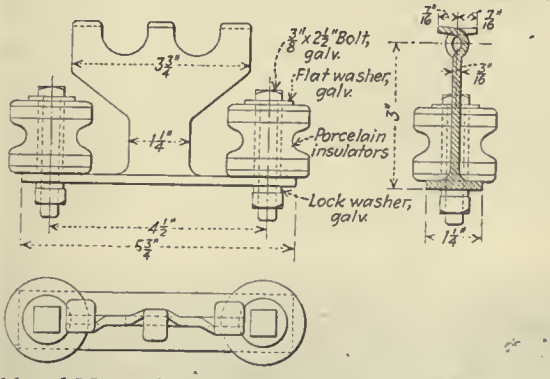

### D.C. Disconnecting Switch To Be Used Under Crossarm Where Switch Box Cannot Be Used

Where city or municipal authorities prohibit the use of a box on the poles, the type of direct-current disconnecting switch shown is used under crossarm.




### Assembly of No. 2 Straight Way Type Signal Wire Bracket

For carrying signal contactor wires under the span from the signal contactor to the automatic signal, the assembly No. 2 straight way type signal bracket shown is found of particular convenience.




### Assembly of No. 3 Cross-Way Type Signal Wire Bracket

This is used on spans to carry either two signal wires or two telephone wires between turnouts where the same cannot be carried on crossarms due to tree interference, or they may be used between turnouts instead of installing on crossarms.

# *New Offerings of*
# Useful Equipment

## Portable Oil Testing Set

FOR determining the dielectric strength of insulating oils, a new ½-kva. portable oil testing set has been brought out by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. It is mounted



New portable oil testing set

in a cast aluminum case and includes besides the transformer a double pole self-restoring push switch, control rheostat, portable plug for connecting to an ordinary 110-volt light socket, voltmeter calibrated in kilovolts, an oil test cup fitted with standard testing electrodes and a feeler gage for setting. All these are mounted on a panel at the top and inside of the case.

When making a test, the gap between the electrodes is set with the feeler gage and the cup is filled with the sample of oil to be tested. The rheostat control arm is moved forward, so as to give a gradual increase in voltage until the oil in the test cup flashes over. The rheostat control handle returns to the starting position automatically when released. The voltmeter reads the equivalent of the test voltage and the value of the oil failure is thereby observed.

Tests have shown that as little as 0.005 per cent of moisture will reduce the dielectric strength of oil to about one-half its dry strength. The N.E.L.A. recommends that oil samples from all substation apparatus and power station equipment be tested at least once every three months and that samples for distribution transformers be tested at least once a year.

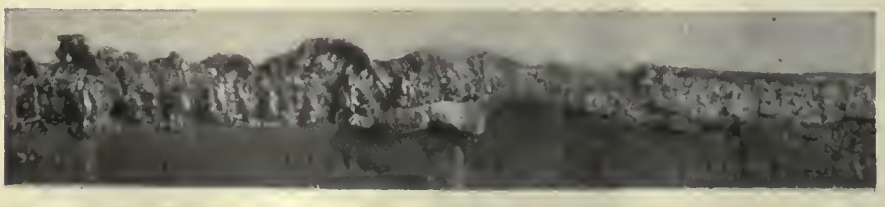
## Welding Rod Increases Speed of Welding

FOR producing a dense weld of great ductility at increased welding speeds, the Lincoln Electric Company, Cleveland, Ohio, has developed a welding electrode known as "Fleet-Weld." The speed of welding has been doubled or trebled by use of the new rod and welding costs have been lowered.

The wide use of high-speed electrodes has been retarded in the past, due to the porosity obtained when the higher currents necessary for fast welding are used. The newly developed rod has overcome this difficulty. In the illustration a comparison is made of the porosity of beads laid down with the common type of wire and with the new electrode.

An incidental advantage which the new electrode offers is the smooth finish of its bead. This in part is caused by the higher speed of travel allowed by the new electrode, and also in part by the composition of the rod.

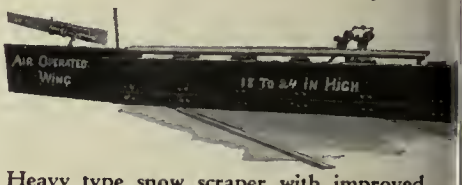
Greater ductility of the bead and deeper penetration are two of the requisites of better welding which the newly developed high-speed wire also offers. The electrode itself is an extruded wire that permits high-speed welding without loss of denseness and ductility to the weld metal. While "Fleet-Weld" electrode has so far been a laboratory product, it is expected to be commercially manufactured and placed on the market in the near future.



The left half of the illustration shows the longitudinal section of weld metal deposited from ordinary wire at higher currents and speed, while at right the deposit is from the newly developed "Fleet-Weld" electrode

## Improved Scraper With Air Wing

FOR removing drifts and heavy falls of snow, a scraper with a wide blade and a side wing, operated by air, has been announced by the Root Spring Scraper Company, Kalamazoo, Mich. The springs are made of $\frac{5}{16}$-in. spring steel instead of ¼ in. used with previous types. They are




Heavy type snow scraper with improved air-operated side wing

bolted to a pipe shaft which rotates in hanger castings. These castings are made of malleable iron and are bolted securely to the hanger board. The hanger board is made of channel steel. The springs have a mould board and attachment to the scraper edge which comes in contact with the pavement. It is reversible, permitting wear on both sides.

Springs are constructed so as to hold the scraper blade to the pavement. In the event of catching any obstruction the springs are forced back, which allows the blade to pass over without injury to the car or to the scraper. The mould board is from 18 to 24 in. high, and is made from 9 to 12 ft. in length. The blade is raised by air cylinders and is also lowered and held in operating position by air.

The air-operated side wing can be attached to the truck or side sill of a car. It is 24 in. high and 6 ft. long. The wing moves the snow from the side of the track, where it is delivered by the scraper, and rolls it 6 ft. away from the car. It can be folded quickly with the car moving to pass automobiles parked along the curb, and can be extended again just as quickly.

# News of the Industry

## Committee on Movement of the Vehicle Considers Congestion

Meeting at the Hollenden Hotel, Cleveland, Ohio, on Dec. 17, the committee on The Movement of the Vehicle, of the Transportation & Traffic Association, proceeded to organize and discuss in a general way the subjects to be studied during the coming year. In recognition of the fact that speed is the prime requisite of good electric railway service, discussion resolved itself around the best ways and means of attaining this end. The prevalent traffic congestion in all of the larger cities of the country came in for its share of comment, as did the question of the parking of autos both in the business sections and outlying districts of cities. It was the consensus of opinion that the halting of cross-traffic at high speed thoroughfares, on which street car service was given, would result both in faster street railway service and fewer accidents.

For future study the work of the committee was divided between four subcommittees to which subjects were assigned as follows:

Committee No. 1, C. H. Evenson, chairman—parking regulations; merchants' survey of store traffic; general traffic survey; store-door deliveries.

Committee No. 2, E. D. Merrill, chairman—signals, traffic control and boulevard stops.

Committee No. 3, Joe Ong, chairman—car and coach stops, platforms and safety zones.

Committee No. 4, R. H. Pinkley, chairman—equipment for handling passengers as related to vehicular movement.

The next meeting of the committee is scheduled for March 1, 1929, in Chicago.

Among those who attended the meeting were D. L. Fennell, chairman; C. W. Wilson, vice-chairman; Paul S. Wilson, sponsor; O. A. Broten, C. H. Chapman, M. W. Cooke, E. R. Fitch, Donald Goodrich, C. H. Evenson, H. H. Hill, E. D. Merrill, J. Metcalf, William H. Lines, Joe R. Ong, R. H. Pinkley, J. C. Thirlwall, W. E. Thompson, and J. W. Welsh, general secretary American Electric Railway Association.

## Exchanging Tickets in Gary

A joint tariff has been filed by the Gary Railways and the Gary & Southern Traction Company of Gary, Ind., with the Public Service Commission of Indiana asking the privilege of exchanging commutation tickets on the lines of the two systems. The Gary & Southern line, recently purchased by the Midland Utilities Company, Chicago, is being operated under the direction of the Gary Railways, which also is a subsidiary of the Midland Utilities Company. Under the proposed tariff the Gary & Southern will sell its 50-ride monthly commutation ticket form, with transfer privileges to the Gary City lines of the Gary Railways, giving passengers from Crown Point on the Gary & Southern the opportunity to use a free transfer to any first connecting zone on the Gary Railways. The charge for monthly commutation books with the free transfer privilege will be $1.50 over the present rate of $11.25.

Changes in the names of all stations between Gary and Crown Point on the Gary & Southern Traction line have also been announced by operating officials. The changes were made to identify the name of each station closely with its territory. Formerly, each station was known as a numbered stop.

## Franchise Negotiations in Rochester

### Active work on preparing new grant to extend present service-at-cost contract to be begun after first of year. Amendments likely

CITY officials of Rochester, N. Y., are gathering data with a view to renewal of the ten-year service-at-cost contract under which the Rochester lines of the New York State Railways are operated. The present contract remains in effect until Aug. 1, 1930, but written notice of renewal must be filed by the Mayor before Aug. 1, 1929.

It appears likely the agreement will be renewed, but it is considered equally certain that it will be amended in several particulars. For one thing, provision must be made in the new contract for operation of the new $12,000,000 city-owned subway in the bed of the abandoned Erie Canal. The railway has been operating the subway lines since Jan. 1, 1928, under an extension of the service-at-cost contract.

The contract, drafted in 1920, attracted wide attention. The city's interests are guarded by a railway commissioner. Charles R. Barnes, a veteran in the street railway industry, has held that position since the inception of the contract system. The contract guarantees the railway a 6 per cent return on its investment. The fare is determined by a balancing account. It is expected that these two features will be retained in the new contract to be made, although the valuation of the lines, which serves as a basis for the whole contract, is sure to be a bone of contention. The city has a suit in the state courts, seeking a lower valuation.

However, the litigation over the valuation of the lines will not be pressed during the life of the present contract, city officials admit. City Manager Stephen B. Story summed up the city position in these words:

> It is always possible that a revaluation may result in setting a higher valuation than now exists. The city wishes to be sure of its ground before proceeding.

City officials also are awaiting a verdict in a valuation case now in United States Supreme Court which is regarded as having a direct bearing on the Rochester situation.

Speaking for the New York State Railways, James F. Hamilton, president, has said that the railway believes a higher valuation is justified, but in the interests of harmony, is willing to let the figure stand as is.

It is expected that actual negotiations for a renewal of the service-at-cost contract will start shortly after the first of the year. City officials studying the situation include, besides City Manager Story, Commissioner Barnes and Mayor J. C. Wilson, members of the staff of the Bureau of Municipal Research.

## The Holiday Spirit

NOW comes the yearly Christmas rush
With almost ev'ry trip a crush;
In ev'ry load are anxious mothers
With babes in arms, kid sisters, brothers,
All on their way to view the toys
St. Nick's prepared for girls and boys.
They'll walk about for miles and miles
Their happy faces wreathed in smiles.
But when the shopping day is o'er
They may be tired and cross and sore,
Their tempers may be sadly tried
When ready for the homeward ride,
So that's the time for us to be
Considerate; our sympathy
And any help we give will tend
To make each passenger a friend.
It's up to us to do our share
By courtesy, good temper, care—
By ev'ry kindly act in reason
To *live* the Spirit of the Season.

—JOHN E. WILKIE,
*Vice-President, in Chicago Surface Lines Service Magazine.*

## To Resume Utility Hearings

Unless court engagements interfere, the Federal Trade Commission is expected to resume public hearings in the publicity phase of its power and gas utilities investigation early in January, according to an interim report of the commission transmitted to the Senate. Between fifteen and twenty accountants are now working in the offices of a

number of the largest holding companies, each of which controls companies in many states. They are securing data supplementary to the information called for, in the general report form sent out by the commission to utility companies.

## New Brief for New York City in Fare Case

Through its counsel, Charles L. Craig, Joseph A. Devery, and Edgar J. Kohler, the city of New York has filed a "brief" with the Supreme Court of the United States in the case of the Transit Commission, etc., and the city of New York vs. Interborough Rapid Transit Company and Manhattan Railway. The brief covers 186 pages, which is considerably less than the number in its previous brief. This latter was criticized by the Supreme Court because it was too lengthy.

### Contracts Not a Subject of Regulation

The new brief shows that the city makes nine points in its argument. They are as follows:

1. The contracts between the city of New York and the Interborough Rapid Transit Company are not a subject of regulation. The city of New York does not require a railroad corporation for the operation of its rapid transit railroads; an individual would do as well, and the terms which the city makes with an operator of its rapid transit system are not subject to regulation under the Public Service Commission law.

2. The power of regulaiton is never exercised except in the public's interest. It is not in the public's interest to frustrate the city's plan and policy for the distribution of its population by a low flat fare. The powers and duties of the municipal government cannot be transversed to or invested in or subordinated to the Transit Commission, a body of State officers, in disregard of the local government provisions of the State Constitution.

3. If the assumption is made that the lessee of the subway is a public service corporation, as distinguished from a private corporation, valid contracts existing between it and the city of New York fix the fare at 5 cents during the term of the lease. This contract was made under full and express legislative authority. The validity thereof and the constitutionality of such legislation have been adjudicated and sustained by the Court of Appeals of the State of New York. Where there is a contract there is no confiscation.

4. The Rapid Transit Act, pursuant to which such contracts and elevated railroad certificates were made, is a comprehensive special section, excluding any possible subordination to the public service commission law.

5. The Legislature has not at any time empowered the Public Service Commission to regulate the rates of fare agreed upon in contracts made by the city of New York pursuant to the Rapid Transit Act.

6. The decisions of the State Court in gas and street surface railway cases do not sustain the conclusion of the court below, but are contrary thereto. In particular, the decision in the so-called Garrison cases on reargument are fatal to the claims of the Interborough Company, based on the Nixon case. The city claims that the three so-called Garrison cases, 229 N. Y. 575, exclude from the control of the Public Service Commission over fares, franchises granted by municipal authority subsequent to the passage of the Public Service Commission law on July 1, 1907. The so-called Nixon case, People ex rel., City of New York v Nixon, 229 N. Y., 356, decided July 7, 1920, upheld the right of the commission to make changes in franchise conditions in certain cases.

7. There is no confiscation of public property from the present fare, in spite of the claim of the company that it is entitled to earn an 8 per cent return on all of the property owned by the city of New York, as well as on its own investment used for rapid transit purposes. The city also claims that there is no confiscation of private property through a maintenance of the present fare.

8. The elevated railroad certificates, by which permission was granted to the Manhattan Railway to build additional tracks and extensions, are affected by the same statutory authority and contract obligations as are the subway contracts.

9. There is no federal question in the case. The court below, whose decision was in favor of the Interborough Company, was imposed upon.

In conclusion, the city counsel ask that the order appealed should be reversed and that the application be denied with costs.




A Railway's Attractive Message

## New Board in Boston

Governor Alvan T. Fuller of Massachusetts has appointed a new board of trustees for the Boston Elevated Railway, Boston, Mass., under the public control act of the Legislature. Henry I. Harriman, president of the Boston Chamber of Commerce and chairman of the Metropolitan Planning Board, is appointed together with General Charles H. Cole, who was the Democratic nominee for Governor this year, and George B. Johnson, president and director of R. H. White Company, one of the largest department stores in Boston, recently consolidated with William Filene's Sons Company.

In addition to these three men, who will be new members of the board, the Governor reappointed Stanley R. Miller and Edward E. Whiting. The men who were dropped from the board are former Congressman Samuel L. Powers and Frank O'Hare.

Under the law the board of trustees will elect its own chairman, and it is expected that it will elect Mr. Harriman, who is one of the best informed men in the state on the subject of transportation facilities for the Metropolitan district. In accepting the appointment Mr. Harriman asked that he be relieved of his post with the Metropolitan Planning Board, and Colonel Charles R. Gow was appointed by the Governor to succeed him on that Board.

## Injunction in Baltimore

The first formal step to get the fare case of the United Railways & Electric Company, Baltimore, Md., before the United States Supreme Court has been taken by the company in the filing of a petition in the Circuit Court of Baltimore. An injunction is sought to restrain the Maryland Public Service Commission from interfering should the company charge a straight 10-cent fare. Company officials explained that the petition does not mean that the United will attempt to put the 10-cent fare into effect, but is an effort to get the legal records in such shape that the case can be taken to the highest court.

Recently, the Public Service Commission, acting on a decision of the Maryland Court of Appeals, reconsidered the depreciation issue of the fare case and authorized the company to charge a 10-cent cash fare with four tokens for 35 cents. At that time the case had been appealed to the Supreme Court, but that tribunal would not consider it because it had been remanded to the Public Service Commission, and the petition was dismissed.

When the original case was taken into the Maryland Courts it was held by Judge Ulman in the Circuit Court that it was confiscatory to limit the company to an earning of only 6.26 per cent. The Court of Appeals, however, held that this was not confiscatory, but remanded the case on the depreciation issue. It was then that the Supreme Court dismissed the petition.

## Another Committee on Congestion in New York

Sixty civic and business organizations have been called in consultation to consider the question of traffic congestion in New York.

A remedy is promised for next summer by a committee of 45, called the New York Citizens' Traffic Committee, organized at a meeting sponsored by the Board of Trade.

Two general plans are under consideration. The committee may urge construction of new traffic facilities, or it may devise methods for more efficient use of the streets.

W. J. L. Banham, president of the Board of Trade, suggested that the committee confine itself to the better use of existing facilities. He pointed out that Day & Zimmerman, engineers engaged by Mayor Walker, are to report in February on the cost of multiple-decked traffic thoroughfares, a tri-borough bridge, a traffic tunnel from Manhattan to Brooklyn, and a traffic tunnel running the length of Manhattan.

Philip Le Boutillier, president of the Retail Dry Goods Association, urged immediate action.

"One of the chief causes of the present situation has been the deferring of action on projects that should have been carried out long ago," he said.

Percy S. Straus, vice-president of R. H. Macy & Company, was appointed to confer with merchants and manufacturers, suggesting that they do their heavy hauling at night.

The parking problem will also be studied. The Fifth Avenue Association is opposed to absolute prohibition of parking, on the ground that it would hurt trade.

Members of the committee, which is to be enlarged later, are as follows:

Dr. John A. Harriss, former deputy police commissioner.
Logan Billingsley, president Bronx Chamber of Commerce.
Gilbert Hodges, president New York Advertising Club.
W. F. H. Koelsch, president 34th Street Midtown Association.
Col. Michael Friedsam, president Fifth Avenue Association.
Arthur H. Woods, president Automobile Association of America.
George W. Sweeney, president 42nd Street Property Owners Association.
George Daniels, president the Merchants Truckmen's Bureau.
John C. Forster, president Eighth Avenue Association.
Lee J. Eastman, president Broadway Association.
Congreve Jackson, president First Avenue Association.
Judge Alfred E. Ommen, West End Association.
Philip Le Boutillier, president Retail Dry Goods Association.
William G. Campbell, president Central Park West and Columbus Avenue Association.
William J. Pedrick, vice-president, Fifth Avenue Association.
C. E. Denney, vice-president Erie R.R. Company.
Albert Behning, president Harlem Board of Commerce.
David Robertson, president Downtown League.
Fred Muschenheim, president Hotel Men's Association.
Henry A. Wise Wood, manufacturer.
R. A. Pope, engineer.
W. W. Arnheim, merchant.
George H. Pride.
James P. Roe.
W. G. Curren, Baltimore & Ohio R.R.
Mr. Horowitz, president Thompson Starret Co.
H. G. Bragg, Automobile Merchants Association.
L. F. Loree, president Chamber of Commerce of the State of New York.
Willis H. Booth, president Merchants Association.
Peter Grimm, president Real Estate Board.
Philip D. Hoyt, first deputy police commissioner in charge of traffic.
Charles H. Tuttle, United States Attorney.
Richard E. Enright, representing the Civitan Club.
Robert E. M. Cowie, president American Railway Express Company.
Percy S. Straus, vice-president R. H. Macy & Company.
C. P. Perry, president James McCreery & Company.
J. S. McCulloh, president, New York Telephone Company.
M. S. Sloan, president New York Edison Company.
Frank Hedley, president Interborough Rapid Transit Company.
George McLaughlin, president Brooklyn Chamber of Commerce.
L. C. L. Smith, president Queensboro Chamber of Commerce.
Richard S. Childs, president New York City Club.
Jules S. Bache, banker.
John F. Galvin, chairman Port Authority.
Sol Raives, Theater Owners' Association.

## How Railway Men Look as Santa Claus

Neil Funk, of the Louisville Railway, Louisville, Ky., was one of a number of business men cartooned by Paul Plaschke, staff cartoonist of the Louisville *Courier-Journal*, who ran them on a special sheet on Dec. 16, under the heading "How They Would Look As Santa Claus." Neil has been much in the limelight as a leader in Safety Work.




## Grand Rapids Speaker Urges Co-ordination

Former Commissioner Edwin F. Sweet of Grand Rapids, Mich., returned to that city from the recent conference of the National Rivers and Harbors Congress at Washington, convinced more than ever of the need of co-ordination of city transport services. This he made plain in an address before the local commission in Grand Rapids. Mr. Sweet reported in Philadelphia the operating utility has pressed taxicabs and buses into service to relieve the situation, and information received from officials of that company was to the effect there was no apparent reason why a similar system could not be worked out in Grand Rapids. He said:

There is in my mind particularly an idea that perhaps such a system, working with only one overhead expense and as one corporation and under the necessary city supervision, could give better results with less expense to the public.

Outlining the increased need for transportation at reasonable cost in the years to come, Mr. Sweet recalled Herbert Hoover's statements several years ago that the population of the United States had doubled in 25 years and the country would need twice as much transportation facilities in the next 25 years.

No official action was taken upon Mr. Sweet's suggestion that a special investigating committee be appointed to gather data on the local transportation situation, but those present appeared to be in sympathy with his idea.

## Activities in Cleveland

The City Council of Cleveland, Ohio, recently passed Cleveland Heights' fare franchise, providing for a rate 2 cents higher than Cleveland's fare and for extensions on Mayfield, Fairmount and Cedar Roads. The increase goes into effect as soon as extensions are completed about Jan. 1. East Cleveland already pays the 9-cent fare. Other suburbs are expected to follow.

Cleveland city and county officials have backed the plan to take all street cars off the Public Square and build a subway terminal underground there to relieve surface traffic.

## Judges to Hear Decatur Fare Case

Five superior court judges have been appointed by Governor L. G. Hardman, of Georgia, to serve in the places of as many supreme court judges who recently declared themselves disqualified to hear the appeal of the Georgia Power Company from the 5-cent fare decision affecting Decatur. Only one justice of the Supreme Court—Marcus W. Beck—was qualified to sit in the case, all the others having declared that relatives owned stock in the company.

A hearing on the appeal will be held shortly.

## Committee Indorsed in Chicago

The committee on local transportation of the Chicago City Council has indorsed the citizens' traction settlement committee appointed by Federal Judge J. H. Wilkerson. However, the council committee provided in its resolution of indorsement that other citizens or civic clubs should be permitted to participate in the negotiations. The purpose of the citizens' traction settlement committee is to study all interests and make recommendations.

## Brooklyn City Operators Win Bonus Awards

Distinguished from their fellows by an accident-free year to their credit, 52 motormen, conductors and safety car operators of the Brooklyn City Railroad were entertained at luncheon Dec. 15, 1928, as the guests of Clinton Morgan, general manager, and, in addition to receiving their regulation bonus of $60, were presented with Hamilton railroad-model watches. Four of the number, who had operated two years without a chargeable accident and had already received watches, were presented satin-lined cases, each containing five $10 gold pieces.

After the luncheon at which the presentations were made, A. L. Hodges, assistant general manager, visited the various carhouses on the system and distributed bonus checks to other trainmen, not quite so fortunate as the 52, but enough so to have won bonuses aggregating $77,300. Of a total of 2,182 car operators on the Brooklyn City system, 2,099, or 96.2 per cent, qualified for the individual bonuses, receiving from $5 to $60 each.

This was the third bonus distribution to the Brooklyn City men, the award having been instituted Aug. 1, 1926. The 1926 bonus award was $20,770, the 1927 bonus was $71,470, and the one distributed Saturday totalled $80,600. During the year ending Nov. 30, 1928, "at fault" accidents on the property were reduced by 28 per cent compared with the preceding twelve months.

## Heavy Electric Traction Committee Organizes

The first meeting of the year of the heavy electric traction committee of the American Electric Railway Engineering Association was held in New York on Dec. 14. The principal purpose of the meeting was to organize the work for the ensuing year and appoint the various sub-committees. Those present were: Messrs. Armstrong, Birch, Brown, Blake (representing Mr. Buck), Butt, Barclay (representing Mr. Cooper), Daus, Davidson, Davis, Febrey, Hagan, Healy, Huber, Grady (representing Mr. Smith), Thorp and Winship; Mr. Neff, guest; and Mr. Hecker and Mr. Baker of association headquarters, a portion of the time. The sub-committees will be made up as follows:

A review of existing manual sections: Messrs. Wells, chairman, Bosenbury, Butt, Davis, Duer, Hagan; study of track and third rail bonds for heavy traction work, Messrs. Febrey, chairman, Birch, Butt, Davis, Duer, Hagan, Thorp and Winship; branch line electrification and self-propelled cars and locomotives; Messrs. Armstrong, chairman, Bosenbury, Brown, Butt, Cooper, Davidson, Healy, Winship and Wright; articulated train operation; Messrs. Daus, chairman, Buck, Hamilton, Johnson, Smith and Wood; train make-up and terminal switching with multiple unit cars; Messrs. Wright, chairman, Brown, Butt, Hagan, Hamilton, Smith, Thorp, Vandersluis and Wells; electrified mileage and electric locomotive tonnage, Messrs. Cooper, chairman, Armstrong, Birch, Buck, Davis, Duer, Healy, Winship and Wood; third rail and overhead clearances with special reference to shipments and steam locomotive operation (if this subject is approved by the association), Messrs. Winship, chairman, Bosenbury, Brown, Butt, Davis, Duer, Johnson, Vandersluis, and Wright.

Thursday, Feb. 28, was chosen as the tentative date of the next meeting.

### COMING MEETINGS OF *Electric Railway and Allied Associations*

***Jan. 4, 1929*—Metropolitan Section, American Electric Railway Association, 33 W. 39th St., New York, N.Y.**

***Jan. 14-18*—American Road Builders' Association, convention and road show, Cleveland, Ohio.**

***Jan. 15-16*—Kentucky Association of Public Utilities, annual meeting, Brown Hotel, Louisville, Ky.**

***Jan. 22*—New York Electric Railway Association, mid-winter meeting and dinner, Hotel Commodore, New York, N. Y.**

***Jan. 23-25*—Electric Railway Association of Equipment Men, Southern Properties, and Southwestern Public Service Association, Mechanical Division, joint meeting, Houston, Tex.**

***Jan. 24-25*—Central Electric Railway Association, Claypool Hotel, Indianapolis, Ind.**

***Jan. 25-26*—Central Electric Railway Accountants' Association, Claypool Hotel, Indianapolis, Ind.**

***Jan. 28-Feb. 1*—American Institute of Electrical Engineers, annual convention, 33 W. 39th St., New York, N. Y.**

***Feb. 7-8*—Midwest Electric Railway Association, Midwinter meeting, Robideaux Hotel, St. Joseph, Mo.**

***Feb. 14*—Central Electric Railway Master Mechanics' Association, Youngstown, Ohio.**

## Committee on Industrial Relations Plans Activities

At the call of Edward Dana, chairman, the committee on industrial relations of the American Association met in New York City Dec. 17 and 18. The matter of subjects to be considered during the coming year was discussed at considerable length and, with the realization that a wide range of activities must be covered, it was finally decided to perfect the organization of three subcommittees to consider the general subjects of education and training, employment and advancement, and health and safety, with J. S. Hyatt, Clint Smith and W. G. Marshall as the respective chairmen.

Among those who attended the meeting and took part in the discussions were L. P. Baurhenn, F. G. Buffe, H. H. Norris, C. W. Chase, H. H. Fenton, Edward Dana, E. C. Foreman, R. W. Emerson, W. G. Marshall, Thomas Fitzgerald, J. S. Hyatt, John Dewhurst, A. J. Sarre, Myles Lambert, A. B. Gibson, Col. W. V. Bingham, representing the Personnel Research Federation, was also present at the invitation of Mr. Dana.

## Suspension Lifted on Pittsburgh Line

Service on the Evans Avenue, McKeesport route, of the Pittsburgh Railways, operated at a 3-cent fare and suspended on Nov. 27, has been restored by the railway pending settlement by the Public Service Commission of the use of the one-man cars on a route of this kind. The withdrawal of the service was referred to in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 8, 1928.

## $106,000 Christmas Bonus for B.-M.T. Employees

Bonuses totalling $106,000 will be distributed shortly to 3,300 employees of the Brooklyn-Manhattan Transit System, Brooklyn, N. Y., who have earned them during the past year under the various plans to promote safety and efficiency of operation. These bonus awards are in addition to awards totalling $27,000, paid by the system in August to 1,100 employees on the rapid transit lines for efficient and courteous service.

## Lease of Seattle Lines Proposed

Declaring a confirmatory vote by the people would be necessary under the city charter to legalize adoption of the plan, Karl H. Kaye, Seattle investment broker, on Dec. 10, urged the Seattle City Council to submit at the next city election an ordinance accepting the proposal of himself and associates to lease the Seattle Municipal Railway System. Accompanied by his attorney, Mr. Kaye appeared in person and urged the Council to an early decision. The matter is now in the hands of the Council franchise committee for consideration and recommendation.

Mr. Kaye and his associates are proposing to lease the municipal railway lines for 50 years, pay off the bonded debt immediately, operate the system for the term of the lease, finance necessary extensions and improvements, and then turn the lines back to the city free of indebtedness. In connection with the railway lease, however, Mr. Kaye asks for a 50-year exclusive franchise for operation of taxicabs and sightseeing cars.

## "Stay Alive" Movement Will Seek 20,000,000 Members

To promote safe and careful driving and walking on public streets and highways, "The Stay Alive Club of America, Inc.," has been formed and will solicit membership from 20,000,000 registered motorists. The directors are Marcus A. Dow and Sidney H. Somerton, New York, and William Boal, Port Chester. Mr. Dow was president of the National Safety Council from 1922 to 1923. He has just written a series of talks on safety for drivers and pedestrians which are brought together in a book called "Stay Alive," reviewed in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 8. The club will be engaged in the dissemination of entertaining and instructive literature looking toward the education of the people in safety.

## Free Rides in Amsterdam

A surprise "free" ride awaits the shopper in Amsterdam, N. Y., through a movement sponsored by the Merchants' Bureau of the Chamber of Commerce which will last until Christmas. On the inbound cars of the Fonda, Johnstown & Gloversville Railroad the free ride is in vogue, but is not known by the shopper until the conductor refuses her fare. One free trip is being made by all the lines from the suburban and residential sections.

## Will Bid for Service in Springfield

In accordance with a decision made recently by the City Commission of Springfield, Ohio, an advertisement for proposals for a transportation system for that city will be inserted in local newspapers. In this advertisement, the City Commission will ask for proposals for electric railway, bus and combined railway and bus service. The proposals must contain terms and conditions suitable for a future franchise, and must state for how long a period of time the franchise is desired.

One of the important stipulations of the commission's request is that bidding utilities shall state the rate of fare to be charged. While the rate of fare will be taken into consideration by the commission and will be considered an essential feature of the proposal, City Commissioners indicate that the main object in asking for proposals is to secure an adequate system of transportation.

# Recent Bus Developments

## Merger for Brooklyn

**Plan now under way would bring B.-M.T. surface routes under separate company with bus auxiliary**

ANNOUNCEMENT that the Equitable Coach Company, New York, would seek modification of its franchise was made by Mayor Walker on Dec. 19, following a four-hour conference, attended by members of the Board of Estimate, Transit Commission and Board of Transportation, and officials and counsel of the B.-M.T. and the Equitable. Earlier in the day the Transit Commission suspended all proceedings in the Equitable's pending application for certificates of necessity and convenience for its franchise routes. The action was taken when the commission was notified that the petition to modify the franchise would be presented to the Board of Estimate.

The steps presage the move to merge the bus routes of the Equitable Coach Company in Brooklyn and Queens and the surface lines controlled by the B.-M.T. into a single corporation entirely divorced from the B.-M.T.'s subway and elevated lines.

The merger contract was among the documents presented to the Board of Estimate on Dec. 20. The petition for modification of the franchise, it is understood, calls for abandonment of some Brooklyn bus routes as originally approved by the Board of Estimate, and the lengthening or shortening of others.

Ultimate approval of the plan by the Board of Estimate and the Transit Commission is expected to provide the following set-up:

1. Merger of B.-M.T. trolley lines and Equitable bus routes in Brooklyn, with the expenditure of from $10,000,000 to $15,000,000 by the new surface transportation company for new cars, buses and other equipment. Bus franchise for Brooklyn to be terminable upon due notice of recapture at price representing actual investment less depreciation, with possibility that trolley car franchises may be changed to terminable type instead of being left perpetual as at present.

2. Operation of 82 miles of bus routes by B.-M.T.'s new corporation in Queens, under same type of terminable franchise, on routes not to conflict with Queens trolley car lines.

3. The Equitable to retain its franchise rights in Manhattan, where it has crosstown routes only. It is understood that the B.-M.T. is to assist in the $4,000,000 of financing required for buses, garages and other equipment.

4. The Equitable stockholders to be paid by the B.-M.T. in securities of the new corporation to the extent of actual money expended by Equitable to date, the amount to be proved at hearings before Transit Commission and not to include any valuation of the franchise rights transferred.

The New York *Times* said:

The Brooklyn City Railroad, with 208 miles of surface lines in Kings County, is left out of the agreement between the B.-M.T. and the Equitable, but the merger contemplates a combination of bus and trolley routes which will not compete with its lines. The merger contract is so drawn as to permit the fitting in of the Brooklyn City Railroad system with the merger routes in the future to make a comprehensive surface transportation layout for the borough. This prospect of ultimate merger of all Brooklyn surface lines is one factor which leads transit circles to believe that the present move is a step toward acquisition of the B.-M.T. rapid transit lines by the city, as part of the general rapid transit unification scheme.

A commentator said:

Word of the merger contract was received in transit circles as confirmation of the report, current in recent months, that the Equitable, balked in efforts to obtain sufficient financial backing and faced with the possibility of protracted litigation over the validity of the franchise and of any certificates of necessity and convenience which it might obtain from the Transit Commission, would be forced to make the best terms possible with the B.-M.T. Although the Walker Administration is not enthusiastic over acquisition of the franchise by any of the existing traction systems, it is felt that the contemplated merger, if properly safeguarded and put through under a system of terminable franchises paving the way to ultimate unification of the city's rapid transit lines, will be a forward step.

The Equitable Company's application to the Transit Commission for certificates of necessity and convenience met with strong opposition from the B.-M.T. in a long series of hearings before the Transit Commission. That body reached a decision on Nov. 15, but deferred announcing it when informed that the Equitable and B.-M.T. were negotiating over route allocations.

## Detroit Jitneys Threaten to Come Back

Jitneys are again appearing on the streets of Detroit under the guise of the Michigan Mutual Auto Owners' Service Corporation. The new company was formed according to a scheme originated by Edward N. Barnard, who acted as counsel for the jitney organizations during the six-year fight which intervened between the time of the passage of the jitney ordinance and the recent Supreme Court decision which upheld the city's right to oust the jitneys. The plans of the corporation were outlined by Mr. Barnard in a talk over the radio. It is intended to return practically all of the former jitneys to their respective runs, unless some step is taken by the city to prevent such action.

All of the jitneys, it was announced, had been transferred to the new corporation. A chauffeur and garage service are to be provided for each car, these items to be supplied by the corporation.

No fare is charged for riding on the jitneys but in lieu of collecting fares, the corporation is offering for sale membership cards which entitle the holders to ride at any time without further payment. Thus no money will change hands in the jitneys. Instead the passengers merely show their membership cards before boarding the jitneys. The charge announced for membership is $5 a month.

This charge is based upon the assumption that regular riders formerly paid at least 20 cents per day for a round-trip ride. All ticket holders are considered members of the corporation, and are regarded as joint owners of the automobiles which can be used only by those holding tickets. It is planned to change the color of membership tickets each month.

The vehicles being used are the same automobiles formerly owned and operated by the members of the Blue Ribbon and the Red Star Motor Drivers' Associations.

Mr. Barnard, their sponsor, says that with the automobiles the property of the participating members, he has made them private cars, and that it will not be necessary for them to have licenses as common carriers. It is further contended that efforts to bar the cars of the corporation from the streets will be nothing short of class legislation.

No efforts have been made by the Detroit Police Department to stop the limited number of white cars that have been put back on their routes, but only a few passengers are being carried. The matter of the next step to be taken by the city rests with Corporation Counsel Clarence E. Wilcox.

## Pending Settlement Would Discontinue St. Louis Line

Permission has been sought by the St. Louis Public Service Company of the Missouri Public Service Commission to abandon temporarily its bus service connecting Maplewood, Webster Groves and Kirkwood, Mo., via the Big Bend and Manchester Roads. The commission on Nov. 2, ordered the De Luxe Bus Company, which was operating over the same route, to suspend operations. That company has ignored the commission's order and is running buses in competition with the St. Louis Public Service Company fleet. As a result, the bus line is costing the railway $165 a day more than receipts. The company wishes to suspend operations until the St. Louis Circuit Court has passed upon the right of the De Luxe company to continue in business over the route.

## Bus Changes in Boston

The Boston Elevated Railway, Boston, Mass., started operating an additional bus line on Dec. 16 and changing the route of another. Fares are four tickets for 25 cents without transfer privilege and a 10-cent fare with transfer privilege.

## Sale of Gary Bus Project Being Arranged

Negotiations for the purchase of the Midwest Motor Coach Company of Gary, Ind., by a new corporation headed by Charles W. Chase, president of the Shore Line Motor Coach Company, are well under way. The Shore Line Motor Coach Company is controlled jointly, through common stock ownership, by the Chicago, South Shore & South Bend Railroad and Gary Railways, both of which lines are subsidiaries of the Midland Utilities Company, Chicago. The Shore Line system is composed of approximately 230 route miles with through service provided between Chicago and Benton Harbor, Mich., and local service in northwestern Indiana. The Midwest Company operates a fleet of coaches between 63rd Street, Chicago and Whiting, Indiana Harbor and Gary. The proposed purchase has not yet been approved by the Indiana Commission.

Mr. Chase announced that the Midwest Motor Coach Company would be operated as a separate unit if the negotiations are successful. Both companies would continue to operate coaches between Gary and 63rd Street, Chicago. The service would be coordinated, however, for the benefit of the traveling public.

In arrangements for the purchase, Mr. Chase said he was acting in an individual capacity. It is understood that the proposed purchase does not involve outright acquisition of the securities of the Midwest company but only its physical assets and coach equipment.

The Shore Line company holds a franchise from the Indiana Commission to carry passengers on its Gary-Chicago route only between points in Indiana and destinations in Illinois. The franchise held by the Midwest company, on the other hand, permits it to handle local business within the state of Indiana as well as interstate traffic. Last summer the two companies became involved in a rate war which reduced through fares nearly 50 per cent.

## Formal Franchises Asked for Syracuse Buses

Formal petitions for franchises for bus lines, instead of the yearly permits now in vogue, were presented to the Common Council of Syracuse, N. Y., recently and referred to the franchise committee without reservation. They bring nearer the effort which the bus owners have been making to better their financial standing by obtaining perpetual grants. If new grants are made on the new basis, they may mean a 7½-cent ticket and a 10-cent cash fare on the motor lines, as is charged on the trolleys.

Application for a fifth line, to serve the eastern part of the city, has been made by Benjamin E. Tilton, vice-president of the New York State Railways. In return for the perpetual rights, the bus lines agree to cover 10 additional miles on the four routes now in operation in addition to the proposed new line east.

They also declare that they will buy twelve new buses to add to the nineteen now in use. The railway has spent nearly $170,000 for bus equipment.

## Express Service Planned on Jacksonville Line

The permit granted by the City Council to the Jacksonville Traction Company, Jacksonville, Fla., for the operation of a bus line from Laura and Forsyth Streets to Avondale and Murray Hill will be signed and become operative when the company files the necessary bond with the city recorder. According to J. P. Ingle, manager, the company plans to operate large capacity buses on the line and to give express service to residents of Murray Hill and Avondale to the downtown section of the city.

## Pennsylvania Company Issues Complaint

Complaint against the Tri-State Motor Freight Company, of Philadelphia, alleging it is operating between Philadelphia and Easton and Allentown and Bethlehem without a certificate of public convenience was filed with the commission by the Lehigh Valley Transit Company, Allentown, Pa.

## Pittsburgh Railways to Expand

Under plans made known through presentation of petitions to the Public Service Commission in Harrisburg, the Pittsburgh Railways and its subsidiary, the Pittsburgh Motor Coach Company, expect to operate the street cars and motor buses of other companies along the Monongahela River, including areas nearly 50 miles from this city. If approved by the commission, the change will be effective Feb. 1. More than a dozen large towns and villages in the upper valley will be affected. Coordination of suburban transportation facilities in the Monongahela valley is sought, it was declared as part of the company to provide "more adequate service."

The petitions seek approval by the commission of agreements whereby the Pittsburgh Railways would operate the West Side Electric and the Webster, Monessen, Bellevernon & Fayette City Street Railways.

The Pittsburgh Motor Coach Company asks permission to operate the West Side Motor Transport Company. Four motor coaches and a number of street cars, the latter operating on about 32 miles of trackage, are said to be involved.

The move for operation under this plan was said to have been made at the solicitation of the smaller companies. By co-ordinating schedules, local railways men held, better service could be provided without additional cost.

## Interstate Bill Introduced

**New measure introduced by Representative Parker requires certificates of convenience and necessity**

A NEW bus bill, to replace the one lost at the last session of Congress, was introduced in the House on Dec. 20 by Representative James S. Parker of New York, chairman of the interstate and foreign commerce committee.

The new measure differs from the old one mainly in the requirement of certificates of "public convenience and necessity" for interstate bus lines and the filing of applications with the Interstate Commerce Commission.

Closer appreciation of each other's problems was reflected in the agreement recently reached on the draft of the suggested bill. Four major changes mark this draft when compared to the Parker bill. Most important is the method of considering and granting certificates of convenience and necessity. Next to that in significance is the agreement upon Nov. 1, 1928, as the date for the grandfather clause. Third is the inclusion of a declaration of policy concerning administration which states that nothing contained in Sec. 500 of the transportation act of 1920 shall be construed to express a policy of Congress in favor of any form of transportation by motor vehicle, or to affect the issuance of a certificate for a bus company deemed proper in the public interest after all pertinent facts and circumstances have been duly considered on their merits. And last is the exemption of interstate motor carriers from the provisions of the Clayton anti-trust act, which makes illegal the consolidation of competing interstate lines. This latter idea applies to two or more motor carriers as well as to a railroad and a motor carrier.

In brief, the new method of considering and granting certificates gives the primary jurisdiction to representatives of the state commissions. However, they act as federal agents, thus reducing greatly the possibility of the measure being unconstitutional.

Under the new draft an application for a certificate would be made to the I.C.C. This body would refer it to a joint board consisting of a representative from each of the states in which the route lies. This representative would be designated by the state commissions either from its own membership or staff, or from the membership or staff of another state commission which is interested in the proceeding. If any state (or states) fails to designate a representative, the joint board would function without him. If no representatives were designated by any of the states, the I.C.C. would hear the case.

Each joint board would decide the matter referred to it. The decision would be filed with the I.C.C. Barring appeals the commission would issue an order or certificate in accordance with the decision of the joint board. If the latter should fail to reach a decision on an application or fail to hear the case within 60 days, the entire matter would then come before the commission for definite action.

## Contentions in Burlington Upheld

The Vermont Public Service Commission upheld the Burlington Traction Company, Burlington, Vt., recently on all of its objections and refused to grant a bus petition to W. S. Appleyard. At two hearings the company contended before the Public Service Commission that the proposed bus line would be in direct competition with its own route in the South Union and Pine Streets section of the city. It also brought out that 3.3 miles of the proposed line would parallel the tracks of the railway.

William S. Appleyard, who would operate the buses, said that the line was a public necessity since the public wished to ride in buses.

## Confessions of a Taxi Driver

"IN ORDER for a taxi to take in any money, it is necessary to keep wheeling all the time that one is on duty. I work from about 10 a.m. to 3 a.m. every morning.

"We were instructed to run on the street car lines and drive very slowly past each corner, as our street pickups were a large percentage of our business. The best stands are located at the corners and (after 10:30 p.m. we could stand all our cars on the street, procuring many more loads from people waiting for street cars) and opposite the theater which is close to —— and —— streets.

"Other business consists principally of people who are regularly street car riders going to and from business. There are very few tips from this type. This type of clientele was largely the working class of people with the exception of our night business.

"However, as one owner quits, there seems to be two to take his place, they assuming that they can well compete with street car service. This same assumption brings forth jitney competition. Why is it allowed?

"I have learned that this jitney and taxi competition in small towns has caused the abandonment of street car operation. I have also learned that due to this competition, certain factors of street railways in large cities have been lopped off. Of course, this results in a greater expense to those whose work and business requires purchased transport means. How long will it be before wage earners and others of industrial communities may tumble to these facts?"—*Motorman, Conductor and Motor Coach Operator.*

## Substitution Planned in Connecticut

The Connecticut Company, New Haven, Conn., has petitioned the Public Utilities Commission to discontinue railway service between Torrington and Winsted and between Thomaston and Waterbury. Permission is also sought to cease service in Portland and across the Connecticut River Bridge from Portland to Middletown. The latter service will be replaced by bus transportation to operate from the Gildersleeve post office to Hillside Avenue, South Farms. All three lines have been operating at an increasing loss despite efficient and economic operation, according to the company.

## Wants Proposals for Operation in Buffalo

Mayor Frank X. Schwab of Buffalo is asking the International Bus Corporation, a subsidiary of the International Railway, Buffalo, N. Y., and other interests to submit proposals for the operation of buses over a route which would connect the new terminal of the New York Central Railroad with the principal downtown hotels, a distance of almost 3 miles. The Mayor says he will recommend to the City Council the granting of a franchise to the company which will operate buses at the lowest rate of fare. The new passenger terminal of the New York Central will be completed and placed in operation about April 1, 1929. No street car or bus lines now reach the section of the city in which the station is being built.

## Rights of Roads on Bus Operation Upheld

The operation by a railroad of a subsidiary bus line without the authority of the Interstate Commerce Commission is permissible under the present law and does not constitute a violation of the interstate commerce act, in the opinion of Examiner Leo J. Flynn.

Dealing with a complaint of an Oregon bus company against the practices of the Spokane, Portland & Seattle Railway in operating a subsidiary bus line, Examiner Flynn reported to the commission that the jurisdiction of the federal body does not cover truck or bus service which extends beyond terminal districts and becomes what is commonly designated as a line haul and which may in effect act as an extension of the lines of the carrier.

The Spokane road, the report explained, organized a new company called the Spokane, Portland & Seattle Transportation Company, which operated a bus line between Portland and Astoria, Ore. All of the capital stock of the transportation company is owned by the railroad. The competing bus line charged in its complaint that the railroad had violated the interstate commerce act by extending its lines (through the bus service) without seeking government permission.

# Financial *and* Corporate

## Passenger Revenue from Madison Fares Increases

Gross passenger revenue from fares of the Madison Railways, Madison, Wis., for November, 1928, showed an increase of $289 over the total reported for a similar month last year. The total for the month this year was $36,700 compared with $36,410 reported a year ago. Railway revenue alone for the month showed a decrease, with only $31,571 reported for November this year compared with $32,246 reported a year ago. Passengers carried on street cars at Madison during November totaled 416,669. This represented fewer passengers than the average for a similar month during the four years between 1920 and 1924 when 592,598 passengers were carried.

## Further Steps in Omaha Bridge Negotiations

Stockholders of the Omaha & Council Bluffs Street Railway are shortly to pass on the question of what price will be fixed for the purchase of the bridge across the Missouri River connecting the two cities. The company also holds title to the lines in the Iowa City. The disposition of these lines is of moment also, because without the bridge and without their operation, in connection with the Omaha lines, they probably could not be operated except at a loss.

Some stockholders who have been interviewed on the proposal say that they should be paid the par value of their stock. This is $1,500,000, and the sale made subject to the $2,000,000 bonds, callable at $2,100,000, as well as the lien of $893,000 held by the Omaha company. The stock has been paying a 4 per cent dividend, because of the $60,000 yearly bridge rental paid by the Omaha company, and has been quoted at $25.

Mayor Dahlman of Omaha says that the joint commission named by him and Mayor Green of Council Bluffs will take no action until after the first of the year. Meanwhile, the commission is gathering necessary data for a new bridge and also a statement of the cost, revenues and operation of the present bridge. Bills are being framed by the corporation counsel for passage by Congress and the Iowa and the Nebraska Legislatures, that will give the cities power to construct or buy a bridge across the interstate stream.

President Shannahan holds that the question of purchasing the present bridge should be settled before others are negotiated. He says the railway would prefer to retain ownership because it cannot hope to receive as its share of any sale price, any amount that will compensate for the $200,000 a year net the lease brings, but being an Omaha institution it must be ready to sacrifice something in allowing the people to have what they wish. That sacrifice must be kept as low as possible, however, because whatever is lost in bridge revenues to the railway might have to be made up in rates. This year more than $100,000 of the net profit on the lease, for which the company pays $60,000 a year, was used to pay interest on railway bonds.

## Suburban Road in New York Does Better

A marked reduction both in operating revenues and in operating expenses characterized the operations of the Auburn & Syracuse Electric Railroad, Syracuse, N. Y., for the quarter ended Sept. 30, over those of the corresponding period the preceding year. Here are the comparative figures:

| | 1927 | 1928 |
|---|---|---|
| Railway operating revenues | $92,497 | $49,874 |
| Railway operating expenses | 82,093 | 31,846 |
| Net revenue, railway operations | $10,404 | $18,028 |
| Taxes assignable to railway operations | 4,689 | 912 |
| Operating income | $5,714 | $17,116 |
| Non-operating income | 608 | 487 |
| Gross income | $6,322 | $17,604 |
| Total deductions from gross income | 22,472 | 22,472 |
| Net corporate loss | $16,151 | $4,869 |

## Increase in Capital Stock of Indianapolis Company

The officials of the Interstate Public Service Company, Indianapolis, Ind., have filed papers with the secretary of state showing an increase in the capital stock of 125,000 shares of no par value common and $2,500,000 preferred.

## Merger Sought for Worcester Companies

Approval has been given by the Massachusetts Public Utilities Commission to the petition of the Worcester Consolidated Street Railway, Worcester, Mass., to take over the property and franchises of the Worcester & Shrewsbury Street Railway and the Worcester & Shrewsbury Railroad. The tracks of the two companies connect with the tracks of the Worcester Consolidated and are leased by them.

Recent hearings disclosed that all the common stock of the three companies is held by the New England Investment & Security Company. Bentley W. Warren stated that a merger was desired to eliminate the cost of rental of the tracks of the two small companies and to bring about a single organization. The two Worcester-Shrewsbury companies concurred in requesting the merger.

## More Shares of St. Louis Stock to Be Offered

The St. Louis Board of Estimate and Apportionment has voted to sell 15,820 shares of St. Louis Public Service Company stock to provide funds with which to complete the Civil Courts Building now under construction. Previously the city sold 400 shares of the stock at $83 a share. A minimum of $80 a share is placed on the 15,820 shares.

## Brooklyn Income Decreases Slightly

For the five months ended Nov. 30, 1928, total operating revenues of the Brooklyn-Manhattan Transit System, Brooklyn, N. Y., were $20,000,198 against $19,551,991 for the five months ended Nov. 30, 1927. Total operating expenses increased from $12,840,031 to $13,142,902 for the current year. After the consideration of total income deductions, the net income for the five months' period of this year was $2,432,231. This compares with $2,460,432 for the period ended November, 1927.

## Part Payment of Denver Preferred Dividend

The Denver Tramway Corporation, Denver, Col., has declared a quarterly dividend of 75 cents a share on its preferred stock, which is at the rate of only 3 per cent whereas the stock calls for 7 per cent. The directors say:

Any increase in the dividend is not warranted just now. At the time the statement of earnings and expenses for the nine-month period, Jan. 1 to Sept. 30, was given to the public, it was accompanied by the announcement that operating revenue for the period had decreased $67,843 and that operating expenses for the same period, due to strict economy and the fact that maintenance was subordinated to a reconstruction program, and in some instances, deferred, had decreased $90,365.

Operating revenues continue to show a decrease, but it is the opinion of the officers and the board that the curtailment in expenses cannot be continued for any sustained period without detriment to the property and public service. Any increase in the dividend under these circumstances is not warranted until such time as there is an adjustment which will result in increased operating revenue. Furthermore, sinking fund requirements approximating $225,000 per annum, which must be met to prevent defaults in mortgages securing bonds, must also be considered in arriving at the net income.

## Partial Discontinuance in Connecticut

Discontinuation of railway service between Rockville, Conn., and Martin's Corner has been announced by the Connecticut Company. Service will be maintained between Rockville and West Bridge, Snipsic Lake, on reduced schedule. Four trips to this point will be made daily, except Saturday when only one trip will be made. There will be no service at all on Sunday.

## Cincinnati Railway Holdings to Car Company Owners

As noted elsewhere in this issue stockholders of Cincinnati Car Company have approved terms of merger with Versare Corporation, Albany, N. Y., into a new company, the Cincinnati Car Corporation. From the deal there will be excepted 89,661 shares of Cincinnati Street Railway stock, ownership of Cincinnati Traction Building Company and earnings and profits of Cincinnati Car Company for 1928. The stockholders of the Cincinnati Car Company have authorized the distribution of Cincinnati Street Railway stock to Cincinnati Car Company stockholders, also the formation of the Cincinnati Traction Building Company, a holding company.

## Additional Directors for Engineers Public Service

The directors of the Engineers Public Service Company recently elected as additional directors, W. Cameron Forbes, partner of J. M. Forbes & Company of Boston and Governor General of the Philippines under President Taft, and Thomas N. Perkins of the Boston law firm of Ropes, Gray, Boyden & Perkins. Both men have been connected with the Puget Sound Power & Light Company, recently acquired by Engineers Public Service, for more than 30 years and are now among its directors. The properties controlled by the company include the Virginia Railway & Power Company, operating in Richmond and other cities in Virginia.

## Strang Line in Receiver's Hands

An interurban, the Strang line, operating between Kansas City and Olathe, has gone into receivership because of inability to meet interest payments on second mortgage bonds. The application for receivership was made by the Fidelity National Bank & Trust Company, trustees for the second mortgage bondholders. Judge George T. McDermott, of the Federal Court in Kansas City, Kan., appointed George A. Clark, Topeka, receiver and J. F. Rhodes, Kansas City, attorney for the receiver. In January, 1927, the company was compelled to default in the payment of interest on its bonds. Increasing use of the private automobile by people living along the line is blamed for the shrinkage in revenue.

The company was incorporated in 1905 by the late W. B. Strang as the Missouri & Kansas Railway. It soon came to be better known as the Strang line. The company is capitalized at $1,777,000 of which $1,000,000 is in stock, $500,000 in first mortgage bonds, and $277,000 in second mortgage bonds. Thomas Riley, builder of the road, has been vice-president and general manager since its completion. Mr. Strang died several years ago, but it is understood his estate retained stock in the company.

The company lists physical assets of 22 miles of tracks and a right-of-way extending from the western city limits of Kansas City to Olathe; five passenger coaches; two freight cars, shops and carhouse at Overland Park.

## Providence Company Would Issue Securities

Petitions by the United Electric Railways, Providence, R. I., for the issuance of stocks and bonds to reimburse it for for capital expenditures have been filed with the Public Utilities Commission.

The United Electric Railways, in one petition, seeks authority to issue $265,800, principal sum, prior lien mortgage 25-year 6 per cent gold bonds; $60,000 general refunding mortgage 30-year gold bonds and 170,200 shares of common capital stock.

Another petition by the same company seeks authority to issue $280,000 principal sum prior lien mortgage 25-year 6 per cent gold bonds, and 500,000 shares of common stock to reimburse its treasury for like purposes.

## Anticipated Returns in Portland

Passenger revenue of the Cumberland County Power & Light Company, Portland, Me., for September, 1928, was $97,025 against $93,294 for a similar month a year ago. In October, 1928, passenger revenue was $100,025 against $93,611 for October, 1927. These figures reflect the anticipated results of the fare increase which became effective on July 1, 1928, and show an improvement over the July returns on the higher fares. In that month revenues increased 4½ per cent.

Rates provide an initial cash fare of 10 cents for a two-zone ride or less, and a 5-cent cash fare for each additional single zone. School tickets are on the basis of 5 cents for a continuous ride of three zones or less and are valid for a two-zone ride or less.

## Discontinuance on One Chattanooga Division

Upon petition to the Tennessee Railroad and Utilities Commission, the Chattanooga Traction Company was granted permission to discontinue service on the Woodland Heights division, effective Feb. 1, 1929. The petition set out that the railway was losing $400 monthly in the operation of the line.

## Market Street Earnings Hold Up

H. M. Byllesby & Company announce that net earnings, including other income of the Market Street Railway, San Francisco, Calif., for the twelve months ended on Nov. 30, were $1,465,949, compared with $1,644,323 for the previous year. Gross earnings were $9,795,829, against $9,827,296.

## Holding Company Organized by Delaware & Hudson

The Delaware & Hudson Railroad has been incorporated in New York State by the Delaware & Hudson Company to own and operate the railroad properties of the Delaware & Hudson. Organization of the new company follows authority granted to the directors by shareholders to segregate the railroad assets into a new corporation, all of whose stock would be owned by the Delaware & Hudson Company. Completion of the latest step will leave the Delaware & Hudson Company strictly a holding corporation, owning all of the stocks of the two operating companies which will run the coal and rail business and owning stocks in electric railways and other enterprises.

Under its old charter granted more than one hundred years ago, the Delaware & Hudson Company has been operating by an act of the New York State Legislature. Its rail operations under this charter, according to L. F. Loree, president, have been restricted more than those of companies running under the general railroad law of the state.

The Delaware & Hudson Company is not selling to the new corporation its miscellaneous properties. The new company, parceling the railroad lines separately, would make it more feasible for the Delaware & Hudson to dispose of its railroad interests if such appeared best in the settlement of the Eastern consolidation plan.

In the wake of the additional news of the proposed segregation of the properties of the Delaware & Hudson Company comes the statement that the company will shortly announce the sale of its system of electric railway properties in northern New York State. The Delaware & Hudson entered the electric railway business at about the same time the New Haven did, although on a much smaller scale. It is said to be the desire of the management to dispose of these properties, now that earning power is being shown by the electric railways following the increase of the fare in the Albany district to 10 cents and the abandonment of some of the unprofitable interurban mileage.

The Delaware & Hudson Company now owns the United Traction Company of Albany. This system with subsidiaries controls more than 216 miles of electric railway serving the cities of Albany, Cohoes, Rensselaer, Troy, Watervliet, Glens Falls and Ballston. In addition, the company owns half the stock of the Schenectady Railway, the other half being owned until recently by the New York Central Railroad.

This electric railway system constitutes one of the most important in the State from the point of view of mileage. The liness were acquired in 1905 by the Delaware & Hudson, and represented an initial investment of approximately $14,500,000. Later, large advances were made by the parent company to help develop these lines and meet their fixed charges.

# Personal Items

## J. H. Morgan Appointed Auditor in Detroit

John H. Morgan, Detroit City Statistician and former member of the Michigan State Tax Commission, has been appointed auditor of the Detroit Department of Street Railways, by the street railway commission. It has been announced that the auditor will retain his position as city statistician. Mr. Morgan, the commission announced, will make a financial survey of the Detroit Street Railway, the first step toward an up-to-date audit being a complete appraisal of the property. This, it is expected, will require several months. Mr. Morgan has had extensive experience in auditing utilities, including the Detroit Edison Company, Michigan State Telephone Company and the Detroit City Gas Company.

The audit made by Price, Waterhouse & Company, covering the conditions of the Detroit Street Railway system up to June 30, 1928, is to be brought up to date by Mr. Morgan, using the same methods employed in auditing private utility companies. Several audits have been made in the past by Price, Waterhouse & Company, differing from those of the Detroit Street Railways' auditor on the manner of figuring depreciation. The different methods of approach to this problem have been the subject of discussion previously in the ELECTRIC RAILWAY JOURNAL. They are a matter of interpretation of the conditions under which the system is run.

## Employee Elections in Buffalo Co-operative Association

Robert H. Gilbert, Niagara Falls, a motorman on the Niagara Falls high-speed line division of the International Railway, Buffalo, N. Y., was elected president of the International Railway Employees' Co-operative Association for 1929, at the annual meeting of the organization held in Buffalo. Isidor Spati, air compressor repairman in the mechanical department at the Cold Spring station, was elected vice-president.

## Changes in El Paso

H. C. Webb, Jr., sales manager of the El Paso Electric Company, El Paso, Tex., since March, 1927, has been transferred to the Virginia Electric & Power Company as sales manager at Richmond. In this capacity he has served at Baton Rouge and at Lake Charles as superintendent of sales of the Gulf States Utilities Companies.

J. H. Warden returns to El Paso to fill the vacancy caused by the withdrawal of Mr. Webb. At the time of his transfer to Lake Charles, La., in March, 1927, he was acting sales manager at El Paso. He also has had considerable experience with other Stone & Webster properties.

## R. B. Stearns to Devote Time to Personal Interests

When Robert B. Stearns, vice-president, general manager and treasurer of the Eastern Massachusetts Street Railway, Boston, Mass., resigns on Jan. 15, 1929, he hopes to avoid a lot of



R. B. Stearns

the pressing details of business activities, but by no means does he plan on being idle. As indicated previously in the JOURNAL, Mr. Stearns will continue as a director of the company. The effective date of his resignation coincides with the date of expiration of the ten-year public trusteeship. Mr. Stearns has managed the property during these entire ten years; in fact, he went with the road in the summer of 1917 from a long and varied street railway experience in the Middle West.

The Bay State Street Railway, which was the predecessor of the present Eastern Massachusetts Street Railway, was already headed for receivership when Mr. Stearns took charge in the summer of 1917. In December of that year the road did go into a receivership and in June, 1919, it passed under the control of a board of five public trustees. Mr. Stearns brought to this system modern methods and has witnessed—indeed has taken the most prominent part in achieving—the entire transformation of the Eastern Massachusetts Street Railway from a bankrupt system extending throughout the entire eastern part of Massachusetts to one now in most excellent physical condition, with restored finances and greatly improved *esprit de corps.*

It will be recalled that under the supplementary public control extension act, which has been accepted by stockholders of the Eastern Massachusetts, a new board of three public trustees will be appointed by the Governor to operate the road for five years dating from next Jan. 15. One of the first important duties of the new board will be to select a successor to Mr. Stearns.

It is generally agreed that in leaving the road after giving practically his entire time to it during the past eleven years, Mr. Stearns does so with the present physical and financial condition of the company in a highly satisfactory condition.

## Hoover to Name Seven to Interstate Commerce

Before he leaves the White House President Coolidge must name two members to the Interstate Commerce Commission and a third named as a recess appointment must be confirmed by the Senate. Claude R. Porter, Iowa Democrat, a lawyer formerly with the Federal Trade Commission, was appointed by the President to fill the unexpired term of Henry C. Hall, ending Dec. 31, this year. Patrick J. Farrell, former counsel for the commission, has not been confirmed yet as commissioner. The term of Clyde B. Aitchison, Republican lawyer, of Oregon, appointed first in 1917, expires this year.

At the end of 1929 the terms of Joseph B. Eastman and Richard V. Taylor expire. Mr. Eastman was appointed from Massachusetts by President Wilson. He is regarded as the leader of the "liberals" on the commission. Mr. Taylor, appointed from Alabama by Mr. Coolidge, is the only former railroad executive on the commission.

In 1930 the terms of Thomas F. Woodlock and Frank McManamy end. Mr. Woodlock is a Coolidge appointee. He has frequently dissented from majority rulings of the commission. Mr. McManamy, a Democrat, was appointed by Mr. Harding.

Johnston B. Campbell and Balthasar H. Meyer are slated to retire at the close of 1931. Mr. Campbell, another Harding appointee, is a lawyer from the state of Washington. Mr. Meyer, economist and professor, has been with the commission since he was appointed by Taft in 1911.

Only one commissioner's term ends in 1932, that of Ernest L. Lewis, former newspaper writer, appointed from Indiana by Mr. Harding and reappointed by President Coolidge in 1925. Ezra Brainerd, appointed by President Coolidge to succeed Commissioner J. J. Esch, will be in until 1933.

D. E. BELL, general manager of the St. Helens Corporation Tramways, England, has been appointed general manager of the Yorkshire (Woollen District) Electric Tramways.

# Paul Shoup Heads Southern Pacific

## Official long directing head of Pacific Electric Railway and other railways operating 1,500 miles of electric railway made president of western railroad empire

PAUL SHOUP, vice-president of the Southern Pacific Railway, president of the Pacific Electric Railway, first vice-president of American Electric Railway Association and an officer of the electric railways controlled by the Southern Pacific, has been elected president of the company to succeed William Sproule.

Announcement to this effect caused very little of a stir. For this there is very good reason. Toward the post to which he has been elected, Mr. Shoup, it has long since been recognized, was directly headed. He has been with the Southern Pacific since 1891. Over the years his advance was not spectacular, but he climbed from post to post, being signally honored on July 11, 1918, when he was elected a director, vice-president and assistant to the president of the Southern Pacific Company. While his election made him one of the highest officials of the Southern Pacific, Mr. Shoup did not sever his connections with the Pacific Electric Railway, of which at that time he had been president since 1912. He was the executive representative of the Southern Pacific Company on the Pacific Coast with headquarters in San Francisco. He also continued to have general supervision over the Pacific Electric Railway and at that time succeeded William Sproule in connection with the various corporations in which the Southern Pacific Company is interested.

As president of the Pacific Electric Railway, in which he succeeded William F. Herrin, Mr. Shoup has been responsible for the management and operation of one of the largest systems of city and interurban lines in the United States. The properties embrace 1,060 miles of road, with very diversified service. They are known particularly for their high-grade service and for their excellent personnel.

Prior to 1912 Mr. Shoup was vice-president of the lines. Before becoming connected with the Pacific Electric Railway he was assistant general passenger agent of the Southern Pacific Company. He entered the service of the Southern Pacific Company in 1891 as a clerk in the office at San Bernardino, Calif. When the narrow-gage railroad between Riverside and San Bernardino went into the hands of a receiver, Mr. Shoup was practically in charge, and he is said to have been largely responsible for converting the road into a paying investment. Mr. Shoup next entered the passenger department of the Southern Pacific Company. Soon thereafter he went to San Jose as district freight and passenger agent of the road. He went to Portland, Ore., later and reorganized the freight department of the Southern Pacific Company in that city.

From December, 1908, until April, 1910, Mr. Shoup gave his time to the interests of the late E. H. Harriman in California not related to the Southern Pacific Company. Prior to his election as vice-president of the Pacific Electric Railway Mr. Shoup was assistant general manager of the Southern Pacific Company, in charge of its electric lines in California, which included the Los Angeles-Pacific Company and Peninsula Railway, San Jose.



Paul Shoup

In addition to being president of the Pacific Electric Railway, Mr. Shoup at the present time holds among other electric railway offices those of president of the Visalia Electric Railroad, vice-president of the Fresno Traction Company, vice-president of the Northwestern Pacific Railroad and president of the Stockton Electric Railroad. The electric railway systems of which he is an officer, operate about 1,500 miles of track.

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MACK NOMBURG, newspaper man, was appointed as assistant secretary to the New York Transit Commission recently to succeed George Wood. Mr. Nomburg was on the staff of the New York City News Association.

R. HOGGARD, formerly general manager of the Lincoln Corporation Tramways, England, has been appointed general manager of the Chesterfield Corporation transport undertaking succeeding W. G. Marks, who was recently appointed general manager of the Nottingham Corporation Tramways. The Chesterfield undertaking was recently converted from tramway to bus. Mr. Hoggard's previous experience includes positions with the tramway undertakings of Sheffield, Wigan and Lincoln.

### "Success" to Virginia Men

In the November issue of *Vepcovian*, the official publication of the Virginia Electric & Power Company, Richmond, Va., best wishes and good luck are heaped upon J. Frank McLaughlin, Tom P. Walker and Joseph Bowes, whose promotions were referred to in ELECTRIC RAILWAY JOURNAL, issue of Nov. 17. Mr. McLaughlin has been promoted from vice-president in charge of operation at Richmond to district manager of the Stone & Webster properties in Texas, Louisiana, New Mexico and vicinity. Mr. Walker, formerly vice-president of the company in the Norfolk district, succeeds Mr. McLaughlin. Joseph Bowes goes from the El Paso district to the Norfolk district as vice-president of the company.

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### Change in Louisville Legal Staff

Charles W. Milner was elected general counsel of the Louisville Railway, Louisville, Ky., at a recent meeting of the directors and also a director and a member of the executive committee. He was formerly assistant general counsel. He succeeds Churchill Humphrey, who has tended his resignation to the board after serving as general counsel since 1920.

Mr. Milner is a native of Atlanta, Ga. In 1909 he received the LL.B. degree at the University of Louisville. He is a member of the law firm of Humphrey, Crawford and Middleton.

# OBITUARY

JOHN J. APPEL, vice-president of the Indianapolis Street Railway, vice-president of the Terre Haute, Indianapolis & Eastern Traction Company, director of the Terre Haute Traction & Light Company and other corporations, died recently. He was also president of Gregory & Appel, Inc., and was a well-known capitalist and business promotor in Indianapolis. Although a conspicuous figure in the utility field, he never served in the operating end, but lent his genius toward improving enterprises and working out the financial organization of properties. Mr. Appel was 69 years old.

RICHARD M. KERSCHNER, associated with Hubbard & Company for the past sixteen years, died on Dec. 8, in Zelinople, Pa. Upon leaving school Mr. Kerschner obtained a position with the old Chicago Edison Company, with which he remained until 1900 when he joined the sales force of the Union Electric Company of Pittsburgh. In 1914 he joined the sales department of Hubbard & Company, later becoming sales manager. In 1924 he supervised the buiding of the new Hubbard factory at Oakland, Calif., remaining in charge there until 1927 when he returned to Pittsburgh to assume charge of the department of development and research, in which position he was active up to the time of his death.

# Large Equipment Orders Pending

**Lackawanna asks bids on $18,000,000 electrification. Brooklyn consolidation may mean $15,000,000 car order. $5,000,000 terminal for St. Louis. New freight interchanges being constructed by South Shore Lines**

PLANS recently announced have advanced to the place where the Delaware, Lackwanna & Western Railroad, Hoboken, N. J., is inviting bids for its electrification project. The initial cost will be from $10,000,000 to $12,000,000 for track, rolling stock and distributing equipment. If satisfactory arrangements for power supply are not made, the company will build its own power station which will mean an added cost of about $4,000,000. The ultimate cost of the entire electrification is approximately $18,000,000. Unlike the Pennsylvania Railroad electrification from Wilmington to New York, which will use 12,000 volts, the Lackawanna has decided to use 3,000 volts direct current. It is not planned to extend the electrification beyond the suburban district for some time.

### Possibility of Large Car Order

From $10,000,000 to $15,000,000 will be spent for cars by a new company, if the plans go through to which reference is made elsewhere in this issue, for the consolidation of the surface lines of the Brooklyn - Manhattan Transit Company and their separate operation, and for that company to take over the grants for bus operation already made to the Equitable Coach Company, subject to confirmation by the Transit Commission. The new company would probably start to function early in 1929.

Construction of three new freight interchanges with major steam railroads has been started by the Chicago, South Shore & South Bend Railroad, Michigan City, Ind. Work is now under way on the interchange with the New York Central Railroad at South Bend, Ind., consisting of two interchange tracks, each of nineteen-car capacity. The interchange tracks now being laid at Michigan City will open freight connection with the Michigan Central Railroad and the Chicago, Indianapolis & Louisville Railroad.

Seventy-pound rail laid on treated ties and cinder ballast will be used on each project. The interchange tracks will be electrified for use of the South Shore Line electric locomotives and will employ light catenary overhead. Completion of these three projects will bring the South Shore Line into direct connection with thirteen steam railroads, and a number of belt lines will insure switching connections with all the principal railroads entering Chicago.

### St. Louis Terminal

The Missouri Public Service Commission, in an order issued Dec. 13, grants the Illinois Terminal Company, Springfield, Ill., and the St. Louis Electric Terminal Railway, St. Louis, Mo., a certificate of convenience and necessity for the construction of a $5,000,000 terminal in St. Louis, to include a subway and elevated line. These subway and elevated lines will connect the McKinley Bridge with a new freight and passenger terminal in the blocks bounded by Twelfth Boulevard, Lucas Avenue, Eleventh Street and Washington Boulevard.

Electric operation of 80 miles of the main line of the Great Northern Railway, St. Paul, Minn., has been started between Wenatchee and Skykomish, Wash. Completion of this part of the project along with the boring of the 8-mile cascade tunnel which will be ready for trains shortly after the first of the year, and the relocation of 20 miles of east approach to the tunnel, represents an expenditure of $25,000,000 by the Great Northern Railway in improving its route across the cascades.

### California Construction

In California bids have been called for by the Northwestern Pacific Railroad, San Francisco, Cal., for the construction of a new depot at D Street, San Rafael. This company has also awarded a contract to the Austin Company of California, to construct a $32,500 machine shop at Tiburon, Cal.

The St. Louis Public Service Company, St. Louis, Mo., has started the construction of its new office and shop addition to the De Baliviere Avenue carhouses. The new building will be a two story structure, costing about $40,000. The Springfield Street Railway, Springfield, Mass., and the Worcester Consolidated Railway, Worcester, Mass., have sold wire, rails, poles, and other accumulated equipment amounting to $2,060,718.

The city commissioners of Kansas City, Kan., have announced that they would request the Kansas City Public Service Company to remove and replace with a permanent structure, the wooden street car incline leading from the east end of the Central Avenue Viaduct to the surface at First Street and Central Avenue. The present incline was built in 1923 and was said to cause traffic congestion.

### Rolling Stock

The Chicago South Shore & South Bend Railroad, Michigan City, Ind., has ordered two caboose cars from the American Car & Foundry Company. The Lynchburg Traction & Light Company, Lynchburg, Va., is building a loop in Peakland and has purchased land near Fairview Heights for a "Y" switch which is to be used in turning the one-man cars to be tried out by this company next month. It is planned to bring a new Birney one-man car to Lynchburg for trial. The International Bus Corporation, subsidiary of the International Railway, Buffalo, N. Y., has rebuilt six of its double-deck passenger buses. The stairway to the upper deck has been shifted from the rear of the bus to the front, which enables the bus driver to collect fares. These buses have been equipped with semi-enclosed tops, making it possible to heat the upper deck during the winter months. Additional light has also been installed. In the near future the company plans to remodel in a similar manner other double-deck buses on its system.

Cleveland Railways, Cleveland, Ohio, has placed an order with the White Company for twenty 40-passenger buses. This order is the result of recently placed bids for 25 new buses. The Louisville Railway, Louisville, Ky., has placed orders for two Club-type Studebaker buses. Poughkeepsie & Wappingers Falls Railway, Poughkeepsie, N. Y., has ordered two A.C.F. Fageol De Luxe, street-car type buses, and the Eastern Massachusetts Street Railway has purchased one A.C.F. De Luxe urban-type coach. The Indianapolis Southeastern Railway, Indianapolis, Ind., has purchased five 22-passenger Seminole parlor observation-type Studebaker coaches.

### Equipment Orders

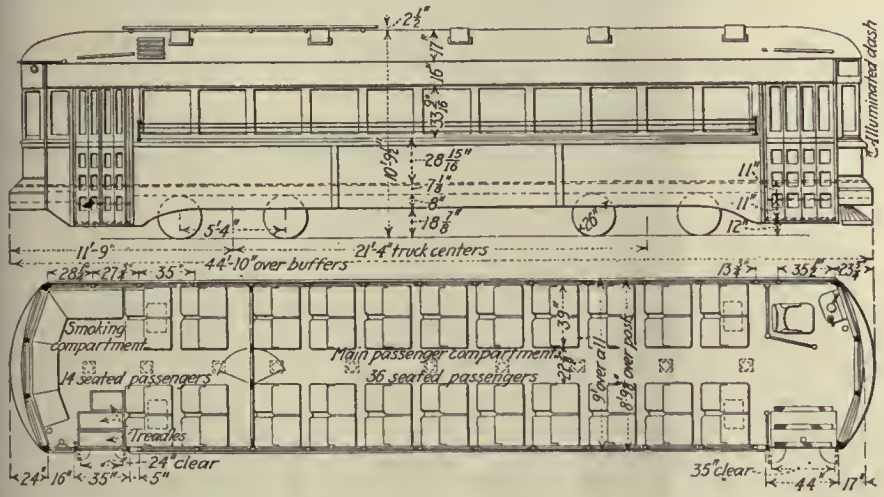
Among orders of equipment purchased recently, the Lehigh Valley Transit Company, Allentown, Pa., has ordered two miles of No. 00 grooved copper trolley wire, two miles of No. 8 weatherproof wire, 400 bags of rock salt, 5,000 type M brake shoes, No. 3153, 1,000 type M brake shoes No. 3154, 56 bags of Tucolith, five 63-tooth gears, six sets of armature coils, 2,500 rolls of friction tape, 2,000 lb. of No. 097 double covered magnet wire and 2,000 lb. No. 9 double covered magnet wire. This company has also purchased 5,000 ft. of snow fence complete with posts and caps, one six-section model steam boiler, and miscellaneous sizes of machine chains.

The Georgia Power Company, Atlanta, Ga., has purchased two electric switching and throwing devices, one signal block and one electric switch, 100 30-ft. creosote pine poles, 1 mile of No. 00 copper wire and 200 26-in. car wheels. The Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., has ordered small supplies of car equipment. The Duluth Street Railway, Duluth, Minn., has purchased 160 class B, 30-ft. Western red cedar poles.

## Specifications of Two Cars for Gary

Midland Utilities Company, Chicago, Ill., has ordered two one-man motor passenger cars from the Cummings Car & Coach Company for the service on the lines of the Gary & Southern Traction Company, which was recently purchased by the Midland Utilities Company and is being operated by the Gary Railway, Gary, Ind.

These cars are of the interurban, single-end, double-truck type, seating 50 passengers. They weigh 42,000 lb. each and are 44 ft. 10 in. long and 9 ft. wide. The bodies are of all-steel construction with arched roofs and folding end doors and are finished in orange and maroon lacquer. The trucks are equipped with two inside-hung motors and 26-in. steel wheels. Both armature and journal bearings are of the plain type. Further details of these cars are given in the following specifications:




Cars being built for Gary & Southern Traction Company seat 50 passengers

| | |
|---|---|
| Date of order | Oct. 10, 1928 |
| Date of delivery | Feb. 20, 1929 |
| Length over all | 44 ft. 10 in. |
| Truck wheelbase | 5 ft. 4 in. |
| Width over all | 9 ft. |
| Height, rail to trolley base | 11 ft. |
| Window post spacing | 35 in. |
| Body | Steel |
| Roof | Arch |
| Doors | End, folding |
| Air brakes | General Electric |
| Armature bearings | Plain |
| Car signal system | Faraday |
| Compressors | GE. CP. 27 |
| Conduit | Flexible |
| Control | G.E. K-75 |
| Curtain fixtures, Rex-National Lock Washer Company | |
| Curtain material | Black Pantasote |
| Destination signs | Hunter |
| Door mechanism | National Pneumatic |
| Energy saving device | Economy meters |
| Fare boxes | Ohmer |
| Finish | Lacquer |
| Floor covering | Rubber tiling |
| Gears and pinions | General Electric |
| Glass | Plate |
| Hand brakes | Cummings |
| Heaters | Truss plank-Railway Utility |
| Headlights | Golden Glow |
| Headlining | ¼-in. Agasote |
| Interior trim | Haskelite |
| Journal bearings | Plain |
| Journal boxes | Service |
| Lamp fixtures | Electric Supplies Company |
| Motors | Four G.E. 247, inside hung |
| Painting scheme | Orange and maroon |
| Registers | Ohmer |
| Roof material | Canvas |
| Safety car devices | Safety Car Devices Company |
| Sash fixtures | O. M. Edwards Company |
| Seats | Hale & Kilburne; bucket type, non-reversing |
| Seat spacing | 35 in. |
| Seating material | Grey Byzantine plush |
| Slack adjusters | Anderson |
| Steps | Folding |
| Step treads | Kass |
| Trolley | Ohio Brass retrievers |
| Trolley base | General Electric |
| Trolley wheels | Holland |
| Trucks | Cummings No. 64 |
| Ventilators | Railway Utility Company |
| Wheels, type | Davis one wear, steel, diameter 26 in. |

## Cincinnati Car-Versare Merger Approved

Stockholders of the Cincinnati Car Company at a special meeting Dec. 14, gave unanimous approval to the merger agreement entered into by the directors of their company and those of the Versare Corporation of Albany, N. Y., as had been anticipated in announcements made a number of weeks ago.

The two plants will be merged in the formation of the Cincinnati Car Corporation, with headquarters in Cincinnati. The engineering facilities and offices of the Albany corporation will be brought to the Ohio city, but physical property will remain at Albany.

To effect the merger, the Cincinnati Car Corporation will purchase all the assets of the Cincinnati Car Company except 89,661 shares of stock of the Cincinnati Railway Company, the Traction Building in Cincinnati and the earnings and profits of the company for the year 1928. The stock will be distributed to stockholders of record at the close of business Dec. 31, 1928. The Cincinnati Car Company will receive for the assets which will be retained for manufacturing purposes, 125,000 shares $20 par value 7 per cent preferred stock and 50,000 shares of Class B stock without par value of the Cincinnati Car Corporation.

The stockholders at their meeting authorized the formation of the Cincinnati Traction Building Company to accomplish a complete distribution of the assets of the Cincinnati Car Company. The Traction Building Company will be the holding concern for the building, surplus holdings, profits for 1928 and the fractional shares of stock of the Cincinnati Street Railway Company, and the 7 per cent and Class B shares of the newly formed corporation—which stocks can not be distributed in kind because of the small fractions into which they would have to be split. Authorization was given the directors to sell these undistributable assets and to make cash distributions of the proceeds.

The agreement provides for issuance to the Versare Corporation of 10,000 shares of Class A stock without par value for all the property of that firm, including patent rights. This stock will be subordinate in claims for assets and earnings, to the 7 per cent preferred stock which the Cincinnati Car Company stockholders will receive. The Versare company will also receive 50,000 shares of Class B stock without par value as additional payment for its interest.

## Public Hearing Held on New York Car Contract

The New York Board of Transportation, building the city's new subway system, held a public hearing Dec. 19 on the draft form of contract for the construction of 300 steel cars for operation from Chambers Street to the Harlem River and 207th Street by the fall of 1930. The hearing was conducted by John H. Delaney, chairman of the board, and Commissioner Daniel L. Ryan. It was attended by numerous representatives of railroad car manufacturing corporations in the eastern part of the country.

In opening the public hearing, Chairman Delaney said that it was the first time in the history of rapid transit in New York City that the car and signal contracts for subway service were prepared by municipal engineers and designers. He related how a group of outside engineers and practical railroad car builders had been in consultation with the engineers and designers of the Board of Transportation for the past year, working out the best possible design and specification which would permit of the widest competition in bidding for the work of car construction.

The Transportation Board Chairman paid public acknowledgment of the gratitude of New York City toward those experts for their gratuitous assistance and advice. He named James S. Doyle, Assistant to General Manager Frank Hedley of the Interborough; W. J. Gove, superintendent of equipment for the B.-M.T. system; A. E. Ostrander, assistant vice-president of the American Car & Foundry Company; W. H. Mussey, general mechanical engineer for the Pullman Company; and W. P. Potter, chief engineer of the General Electric Company.

The Board of Transportation engineer in charge of equipment and operation is Harry N. Latey. The car designer is John O. Madison.

In the presence of representatives of the Pressed Steel Car Company, the Standard Car Company, the Pullman Company and the American Car & Foundry Company, counsel for the latter made some observations of the specifications as drawn for the new cars. The

observations dealt mainly with penalties for non-performance, patent restrictions and other minor points. Brief memoranda were filed by representatives of the several car manufacturers, relative to legal questions and provisions of the Labor Law as being not applicable to other states.

The draft form of contract in the main was not objected to, but some of the car manufacturers asked for more time in which to study the technical construction features of the proposed new cars. Whereupon, Chairman Delaney suggested that each of the larger manufacturers assign a delegate or representative, highly qualified, to discuss with the engineers of the board the various features of the proposed contract.

The public hearing was then adjourned to Thursday, Jan. 3, at 11:30 A.M.

## Towne Service Building Dedicated

The new service building of the Yale & Towne Manufacturing Company, Stamford, Conn., was formally dedicated on November 26th. Funds approximating $500,000 for the erection and care of this building, which will be known as the Towne Service Building, were provided through a special bequest in the will of the late chairman of the board, Henry R. Towne, and this building represents his plans and purposes for the progression and advantage of the thousands of the company's workers, both now and in the future. The structure is modern in construction and up to date in heating, lighting and ventilation facilities, and will admirably serve as a recreational center for the thousands of employees of the company.

The main floor houses the works hospital, dental clinic, and industrial relations bureau. The second floor has a large auditorium, gallery and stage, with a seating capacity of 400. The commodious library is also located on this floor. In the basement are four bowling alleys and two pool tables.

A motion picture outfit will also be installed for the entertainment of the employees.

## Government to Publish Catalog

While the federal standard stock catalog is being prepared primarily for the government service, it is believed that its usefulness could be extended to the commercial field. For this reason it is planned to have copies of the catalog—either complete or in sections—made available for sale through the superintendent of documents, Government Printing Office, as soon as possible after the printing of the book is authorized by Congress.

As the assignment of nomenclature to the items comprised in the catalog is based on a truly scientific system, it is believed that its adoption as a standard will be welcomed by industry and will have a widespread and beneficial effect in the commercial field.

## METAL, COAL AND MATERIAL PRICES F.O.B. REFINERY

| | Dec. 18, 1928 |
|---|---|
| **Metals—New York** | |
| Copper electrolytic, cents per lb | 15.775 |
| Copper wire, cents per lb | 17.875 |
| Lead, cents per lb | 6.5 |
| Zinc, cents per lb | 6.7 |
| Tin, Straits, cents per lb | 49.5 |
| **Bituminous Coal, f.o.b. Mines** | |
| Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons | $4.375 |
| Somerset mine run, f.o.b. mines, net tons | 1.875 |
| Pittsburgh mine run, Pittsburgh, net tons | 1.80 |
| Franklin, Ill., screenings, Chicago, net tons | 1.425 |
| Central, Ill., screenings, Chicago, net tons | 1.15 |
| Kansas screenings, Kansas City, net tons | 1.625 |
| **Materials** | |
| Rubber-covered wire, N. Y., No. 14, per 1,000 ft | $5.5 |
| Weatherproof wire base, N. Y., cents per lb. | 18.625 |
| Cement, Chicago net prices, without bags | 2.05 |
| Linseed oil (5-bbl. lots) N. Y., cents per lb. | 10.4 |
| White lead in oil (100-lb. keg), N. Y., cents per lb | 13.2 |
| Turpentine (bbl. lots), N. Y., per gal | 0.645 |

The importance of exactness and uniformity with respect to nomenclature cannot be overemphasized. With a single standard of nomenclature in general use, the transactions of individuals, firms, industries, and the government—both inside and outside their organizations—would be greatly facilitated, uncertainty would disappear and the routine of supply and procurement standardized, expedited and made more economical.

The government's requirements in the way of supplies and materials cover a very great variety. This is reflected in the catalog by the segregation into 81 classes for storage and issue of the upwards of 60,000 items it will list. Furthermore, this is shown by the fact that these commodities are obtained from 61 main groups of industry, which are further subdivided wherever specialization in industry has developed.

The work of compiling the federal standard stock catalog has been advanced to a point where several of its sections can be published, as soon as funds for its printing are made available by Congress. The bureau of the budget has given its approval to the project, and the question of providing the necessary funds for printing will be laid before Congress at the coming session.

## TRADE NOTES

O. M. Edwards Company, Syracuse, N. Y., has announced that T. P. O'Brian will have entire charge of its sales in the railroad, traction and bus fields in the Eastern and Southern districts. Mr. O'Brian has opened up a new office at 50 Church Street, New York City, and will be assisted by George B. Allison in his new work. Mr. O'Brian started his career in the railroad field in the service of the Pullman Company, working in various capacities until 1910 when he left the Pullman Company to become associated with the O. M. Edwards Company. In 1916 he accepted a position with the Curtain Supply Company in its sales department, having charge of the Southern district. In 1922 Mr. O'Brian was made Eastern sales manager for the Curtain Supply Company, remaining in this position until the company was merged with the Adams & Westlake Company in 1927, when he took charge of the combined Eastern offices in New York City. Mr. Allison became associated with the Curtain Supply Company the early part of 1919 and after three years service in the factory and general office, he became office manager. In 1922 Mr. Allison was transferred to the Eastern sales office in New York City working under the direction of Mr. O'Brian. Mr. Allison will have charge of the Southern district.

Timken Roller Bearing Company, Canton, Ohio, has established two new permanent offices, one in Los Angeles, Cal., and one in Seattle, Wash. The former will be in charge of Roy Cross, with address at 1361 South Figueroa Street, Los Angeles, and the latter in charge of Marshall Cooledge, with address at 321 South Pine Street, Seattle. G. C. McMullen remains as district manager at the company's San Francisco office.

J. W. Fristoe, president and general manager of the T. J. Moss Tie Company, St. Louis, Mo., since 1902, on Dec. 5 was elevated to chairman of the board while E. E. Pershall, vice-president, was elected president. J. S. Penney, who has been general superintendent, becomes vice-president.

H. A. Houston, Wilkinsburg, Pa., has been appointed works manager of the R. D. Nuttall Company, makers of Westinghouse-Nuttall gears, according to an announcement by Vice-President Milton Rupert.

## ADVERTISING LITERATURE

Compressed Air Society, New York, N. Y., has issued the third edition of its "Trade Standards" pamphlet. It has been considerably enlarged and improved, comprising 47 pages in 8½x11 in. size, with numerous illustrations and tables that will be of assistance in the treatment of various compresser problems. New material that has been added includes a description of the A.S.M.E. standard air receivers with list standard sizes of these receivers; pneumatic tool standards; a section on portable compressors; and additional information relating to the installation and care of compressors.

General Electric Company, Schenectady, N. Y., has issued booklets No. 1012 entitled, "Electric Heat in General Electric Factories" and No. 482A on "Silent Gears." The latter booklet gives physical specifications, application data, formulas for helical gears, recommended practice for machining Fabroil blanks, recommended practice for machining Textolite, and dimensions of the various types of gears and blanks.

Treat your present equipment to a set of

# "PEACOCK" Staffless Brakes

If present cars are worth modernizing, they might as well be modernized along the line of safety, too. Treat them to a set of modern efficient hand brakes—"Peacock" Staffless preferably. Incidentally, you'll give your operators, too, a treat in fast and easy braking.

For "Peacock" Staffless Brakes wind up the chain with lightning speed, yes, to the last link, no matter how much slack there is in brake shoes and brake rigging. And the average man can register a pressure of 3000 lbs. What is more, they occupy but little platform space.

Nor are they costly.





NATIONAL BRAKE CO., Inc.
890 Ellicott Avenue
Buffalo, N. Y.

*Canadian Representative*
Lyman Tube & Supply Co., Ltd., Montreal, Can.
The Ellcon Company—General Sales Representatives
50 Church St., New York



# Heralding a year of activity and progress

## *The* ANNUAL STATISTICAL ISSUE

of

## Electric Railway Journal

## *January 12, 1929*

This important issue is being awaited with even greater interest than usual. It will chronicle the achievements of a year that has seen encouraging progress. And it will forecast an increasingly optimistic picture for 1929.

The contents of the issue will include the basic statistics for 1928; a complete picture of the Industry's budgets for 1929; high spots of the year's progress in financing, construction, operation and maintenance, and a review of the advances made by manufacturers.

The advertising pages will, as usual, form an important new year exhibit of the latest in equipment, materials and supplies.

## Advertising forms close JANUARY 2nd







No. 327-M Special seats are in use by the Virginia Electric and Power Company, which was awarded the Charles A. Coffin medal for 1928.

# DESIGNED FOR INTERURBAN USE

THE 327-M Special is a popular Heywood-Wakefield electric railway seat. The deep, double spring construction of the cushion and the restful pitch of the spring-filled backs make this attractive style one of the most comfortable interurban seats ever offered.

The 8M5 Special is a de luxe interurban type with spring-filled seats and backs. It has been purposely designed and built to withstand the most severe use and abuse, while delivering trouble-proof service year after year.

Our car seating experts will be glad to assist in solving your equipment problems. This service is yours without cost or obligation. Just write to the nearest Heywood-Wakefield sales office.

## HEYWOOD-WAKEFIELD COMPANY

Boston, Massachusetts

516 West 34th St., New York City
439 Railway Exchange Bldg., Chicago, Ill.
J. R. Hayward, Liberty Trust Bldg., Roanoke, Va.
A. W. Arlin, Delta Bldg., Los Angeles, Calif.
H. G. Cook, Hobart Bldg., San Francisco, Calif.
The G. F. Cotter Supply Co., Houston, Texas
The Railway and Power Engineering Corporation
133 Eastern Ave., Toronto; Montreal; Winnipeg, Canada

*"Much to encourage, much to inspire, will be found by all of us in the progress made by our industry during the past year."*

So said Mr. R. P. Stevens, speaking at the A.E.R.A. Convention in October. Now, with the record of 1928 completed, and a new year in prospect, the Electric Railway Industry is pushing ahead with a clearly defined program and with greater enthusiasm than has been shown in a decade.

The Annual Statistical and Progress Number of Electric Railway Journal, to be published January 12, will be devoted to a comprehensive presentation of the basic statistics of the industry for 1928. And it will, as in past years, present a complete picture of the budget for 1929; high spots of the year's progress in financing, construction, operation and maintenance; and a review of the advances made by manufacturers.

**ELECTRIC RAILWAY JOURNAL**

*Last advertising forms for this issue close January 2*

# LORAIN

Girder Rails, Special Trackwork, Switches, Frogs and Crossings in Solid Manganese Steel, Manganese Insert Construction, Chrome Nickel Steel Insert Construction and Built-up Construction of all heights and weights of rail

## The Lorain Steel Company

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

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Pacific Coast Representatives: U. S. Steel Products Co., San Francisco, Seattle, Portland, Los Angeles
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"STANDARD STEEL PRODUCTS"




Steel Axles Steel Springs
Armature Shafts
Rolled Steel Wheels

STANDARD STEEL WORKS COMPANY
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BRANCH OFFICES
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PITTSBURGH HOUSTON RICHMOND ST. PAUL MEXICO CITY
WORKS: BURNHAM, PA.

## Truck parts easy to clean

EVEN when the largest of metal car parts are to be cleaned before overhauling, the Oakite way is the effective, economical way.

Truck parts, brake shoes, axles, journal boxes, bearings, wheels, airbrake parts—Oakite materials clean them all thoroughly, quickly, without laborious scrubbing and scraping. Grease, grime and oil are completely removed leaving parts easy to handle and ready for repair work or assembly to proceed unhindered.

Our booklet, "Cleaning in Railroad and Car Shops" tells how and why Oakite materials and methods can save you time and money on every cleaning job. Write for a copy. No obligation.

*Oakite Service Men, cleaning specialists, are located in the leading industrial centers of the U. S. and Canada*

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# OAKITE

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*Industrial Cleaning Materials and Methods*

# Bankers and Engineers

## Ford, Bacon & Davis
Incorporated
**Engineers**
39 Broadway, New York
PHILADELPHIA CHICAGO SAN FRANCISCO

## The J. G. White Engineering Corporation
Engineers — Constructors
Steam and Hydro-Electric Power Plants, Gas Plants, Steam and Electric Railroads, Transmission Systems, Buildings and Industrial Plants.
43 Exchange Place New York

## STONE & WEBSTER
Incorporated
Design and Construction
Examinations Reports Appraisals
Industrial and Public Service Properties
NEW YORK BOSTON CHICAGO

## THE BEELER ORGANIZATION
**Transportation, Traffic, Operating Surveys**
**Better Service—Financial Reports**
**Appraisals—Management**
**52 Vanderbilt Ave. New York**

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ENGINEERS
PUBLIC UTILITIES & INDUSTRIALS
Design Construction Management
Examinations Reports Valuations
CHICAGO NEW YORK SAN FRANCISCO

## ENGELHARDT W. HOLST
*Consulting Engineers*
Appraisals Reports Rates Service Investigation
Studies on Financial and Physical Rehabilitation
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683 Atlantic Ave., BOSTON, MASS.

## ALBERT S. RICHEY
ELECTRIC RAILWAY ENGINEER
WORCESTER, MASSACHUSETTS
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## STEVENS & WOOD
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*Transportation Examinations and Reports*

C. B. BUCHANAN, President — W. H. PRICE, JR., Sec'y-Treas. — JOHN F. LAYNG, Vice-President
## BUCHANAN & LAYNG CORPORATION
*Engineering and Management, Construction*
*Financial Reports, Traffic Surveys*
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BALTIMORE, 1004 Citizens National Bank Bldg. — Phone: Hanover: 2142 — NEW YORK, 49 Wall Street

## WALTER JACKSON
*Consultant on* Fares and Motor Buses
The Weekly and Sunday Pass—Differential Fares—Ride Selling
Holbrook Hall 5-W-3
160 Gramatan Ave., Mt. Vernon, N. Y.

## HEMPHILL & WELLS
CONSULTING ENGINEERS
Gardner F. Wells Albert W. Hemphill
*APPRAISALS*
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Examinations—Reports—Valuations
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68 TRINITY PLACE NEW YORK

## KELKER, DeLEUW & CO.
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REPORTS ON
Operating Problems Valuations Traffic Surveys
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## BYLLESBY
ENGINEERING AND MANAGEMENT CORPORATION
231 S. La Salle Street, Chicago
New York Pittsburgh San Francisco

## E. H. FAILE & CO.
*Designers of*
Garages— Service Buildings— Terminals
441 LEXINGTON AVE. NEW YORK

## SCARR TRANSPORTATION SERVICE, INC.
*Roilway and Highway Consulting Engineers*
An organization of experienced engineers, prepared to assist you in the installation of highway operations as a substitute for or a supplement to your rail operations.
225 BROADWAY, NEW YORK

**THE P. EDWARD WISH SERVICE**
50 Church St. NEW YORK — *Street Railway Inspection* DETECTIVES — 131 State St. BOSTON

When writing the advertiser for information or prices, a mention of the Electric Railway Journal would be appreciated.

**NACHOD & UNITED STATES SIGNAL CO., INC.**
LOUISVILLE, KY.
BLOCK SIGNALS
FOR
ELECTRIC RAILWAYS
HIGHWAY CROSSING SIGNALS



**Arc Weld Rail Bonds**
AND ALL OTHER TYPES
*Descriptive Catalogue Furnished*
American Steel & Wire Company
CHICAGO, NEW YORK, BOSTON, CLEVELAND, WORCESTER, PHILADELPHIA, PITTSBURGH, BUFFALO, DETROIT, CINCINNATI, BALTIMORE, WILKES-BARRE, ST. LOUIS, KANSAS CITY, ST. PAUL, OKLAHOMA CITY, BIRMINGHAM, MEMPHIS, DALLAS, ATLANTA, DENVER, SALT LAKE CITY
EXPORT REPRESENTATIVE: U. S. STEEL PRODUCTS CO., NEW YORK. PACIFIC COAST REPRESENTATIVE: U. S. STEEL PRODUCTS COMPANY, SAN FRANCISCO, LOS ANGELES, PORTLAND, SEATTLE.

**Hale and Kilburn SEATS**
Better Quality Seats For Cars and Buses
Hale & Kilburn Co.
1800 Lehigh Ave., Philadelphia, Pa.

**Kalamazoo Trolley Wheels**
The value of Kalamazoo Trolley Wheels and Harps has been demonstrated by large and small electric railway systems for a period of thirty years. Being exclusive manufacturers, with no other lines to maintain, it is through the high quality of our product that we merit the large patronage we now enjoy. With the assurance that you pay no premium for quality we will appreciate your inquiries.



THE STAR BRASS WORKS
KALAMAZOO, MICH., U. S. A.

**RAILWAY UTILITY COMPANY**
CAR COMFORT WITH
UTILITY
HEATERS
REGULATORS
VENTILATORS
2241-2247 Indiana St. Chicago, Ill. — *Write for Catalogue* — 1328 Broadway New York, N. Y.

**EIGHT WORKS** RAMAPO-AJAX-ELLIOT
Hillburn, New York
Niagara Falls, N.Y.
Chicago, Illinois
East St. Louis, Ill.
Pueblo, Colorado
Superior, Wisconsin
Los Angeles, Cal.
Niagara Falls, Ont. Canada
**Ramapo Ajax Corporation**
RAMAPO AUTOMATIC RETURN SWITCH STANDS AND RACOR DASH POTS FOR PASSING SIDINGS
MANGANESE WORK A SPECIALTY
Sales Office 30 Church St. New York
Also at all works



**Johnson Electric Fare Boxes**



and overhead registers make possible the instantaneous registering and counting of every fare. Revenues are increased 1½ to 5% and the efficiency of one-man operation is materially increased. Over 5000 already in use.
**Johnson Fare Box Co.**
*4619 Ravenswood Ave., Chicago, Ill.*

**GOLD** CAR HEATING & LIGHTING CO.
220 36th St., Brooklyn, N. Y.
ELECTRIC HEATERS WITH OPEN COIL OR ENCLOSED ELEMENTS
THERMOSTAT CONTROL—VENTILATORS
WRITE FOR NEW CATALOGUE

*The* DIFFERENTIAL CAR



*Standard on 60 Railways for*
Track Maintenance
Track Construction
Ash Disposal
Coal Hauling
Concrete Materials
Waste Handling
Excavated Materials
Hauling Cross Ties
Snow Disposal
*Use These Labor Savers*
Differential Crane Car
Clark Concrete Breaker
Differential 3-way Auto Truck Body
Differential Car Wheel Truck and Tractor
THE DIFFERENTIAL STEEL CAR CO., Findlay, O.

THE WORLD'S STANDARD
**"IRVINGTON"**
Black Varnished Silk, and Varnished Cambric, Yellow Varnished Paper
Irv-O-Slot Insulation
Flexible Varnished Tubing
Insulating Varnishes and Compounds
Irvington Varnish & Insulator Co.
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Clapp & LaMoree, Los Angeles
Martin Woodard, Seattle
Consumers' Rubber Co., Cleveland

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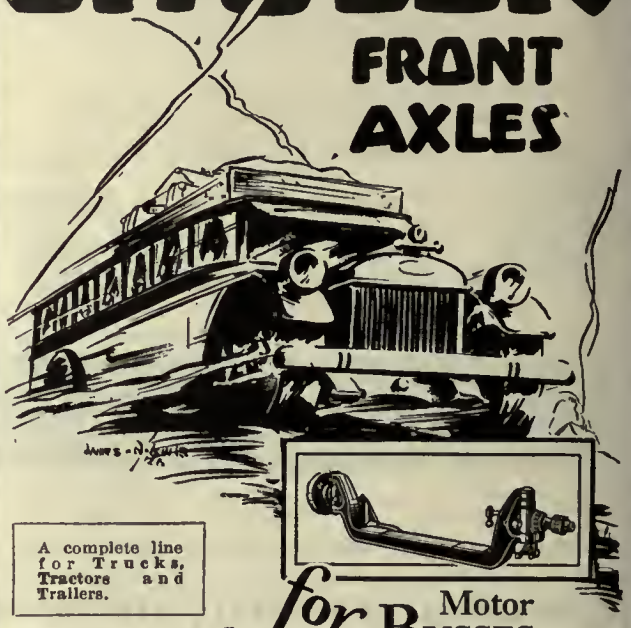
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About 6 miles of good, preferably ASCE Section drilled 2½x5 with angle bars. Must be A1 for immediate shipment. Name lowest price, stating location.

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6000 other electric railway men will see your advertisements of used or surplus equipment and materials here—in the Searchlight Section of their business paper.

Some of these men—officials or executives of other lines in other parts of the country and operating under different conditions—can use what you no longer need. For an insignificant investment you can tell these others what you have. And they will buy.

One "Searchlight" advertiser wrote, "We can cheerfully recommend the Searchlight Section as a wonderful medium for reaching buyers of rails and equipment." Another—"The strongest proof that your 'Searchlight' finds its way to many readers is shown by the numerous letters we have received in answer to our recent ad."

Let us tell you the cost of advertising your used or surplus equipment and materials in the Searchlight Section. Just address a list of what you have to dispose of to the

Searchlight Department

**ELECTRIC RAILWAY JOURNAL**

Tenth Ave. at 36th St., New York, N. Y.

# WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors Advertising in this Issue

This index is published as a convenience to the reader. Every care is taken to make it accurate, but *Electric Railway Journal* assumes no responsibility for errors or omissions.

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Collier, Inc., Barron G.

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Westinghouse Tr. Br. Co.

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Shuler Axle Co.

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Continued on page 32

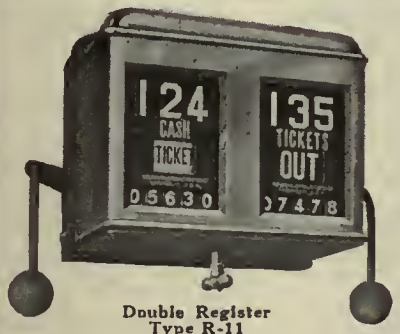
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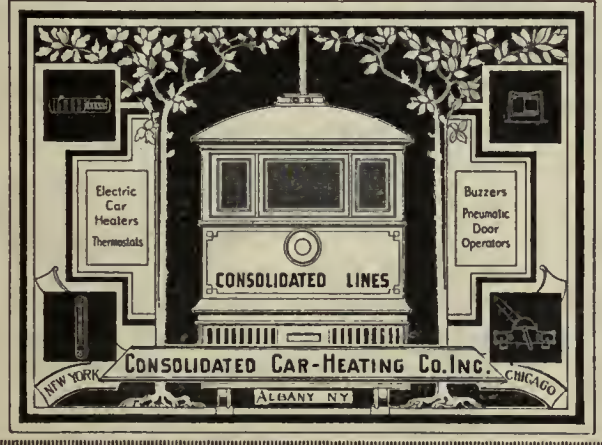
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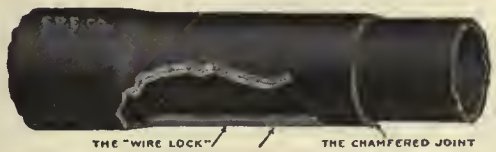
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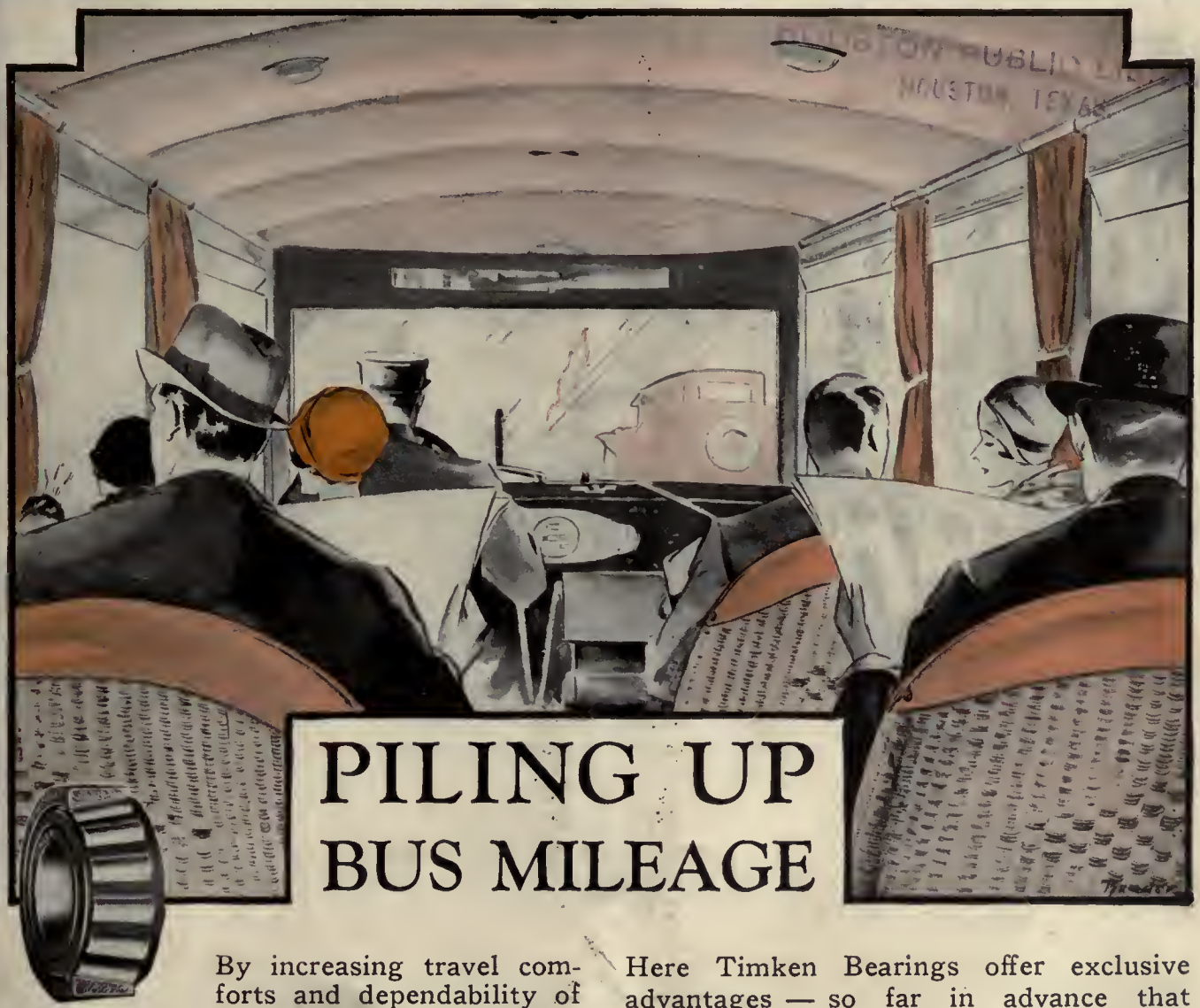
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December 29, 1928

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One of the modern cars of the Pittsburgh Railways Company, passing a block signal protected by Westinghouse K-3 Arresters.



# Protecting Signal Equipment on the Pittsburgh Railways

THE Pittsburgh Railways Company, Pittsburgh, Pa., winner of the Coffin medal in 1925, has found the Westinghouse K-3 direct-current lightning arrester most desirable for the protection of its automatic block signal system and car equipment.

The K-3 arrester gives positive protection against surges induced by lightning.

Years of field service with thousands of installations prove this arrester to be without an equal.

This arrester requires very little maintenance as it has no liquids to freeze or plates to deteriorate.

It is simple and effective in operation, and consists chiefly of a condenser with or without spark gap.

The K-3 arrester is designed for line, car, and station protection on 100 to 1500-volt direct-current circuits.

Mr. N. C. Towle, Transp. Division
Westinghouse Electric & Mfg. Co.
Pittsburgh, Pa.

Dear Mr. Towle:

. . . . We have found the K-3 arrester quite satisfactory in the protection of automatic signals, and also for the protection of the equipment on our cars. The maintenance cost is practically negligible. . . . .

Yours very truly,
The Pittsburgh Railways Co.
A. H. Leschke
Operating Engineer.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania

Sales Offices in all Principal Cities of the United States and Foreign Countries

MEMBER AMERICAN ELECTRIC RAILWAY ENGINEERING ASSOCIATION AERA 1928

# Westinghouse

T 30194

DOLLARS AND SENSE

**If "X" = 75 to 100 Feet**



The ZP Special, an incandescent headlight for city service projects a well diffused light by reason of its prismatic glass reflector. 8⅜ in. convex lens of heat resisting glass. Armco iron case and door. Recess mounted, Page 53, Supp. No. 2, to O-B Cat. No. 20.

**If "X" = 300 to 500 Feet**



The Type WDF is a recess mounted incandescent headlight for city and suburban service. Either crystal or gold ray glass or nickel-plated copper reflector. 8⅜ in. lens. Armco iron case with either lock or spring catch. Page 735, O-B Cat. No. 20.

**If "X" = 800 to 1000 Feet**

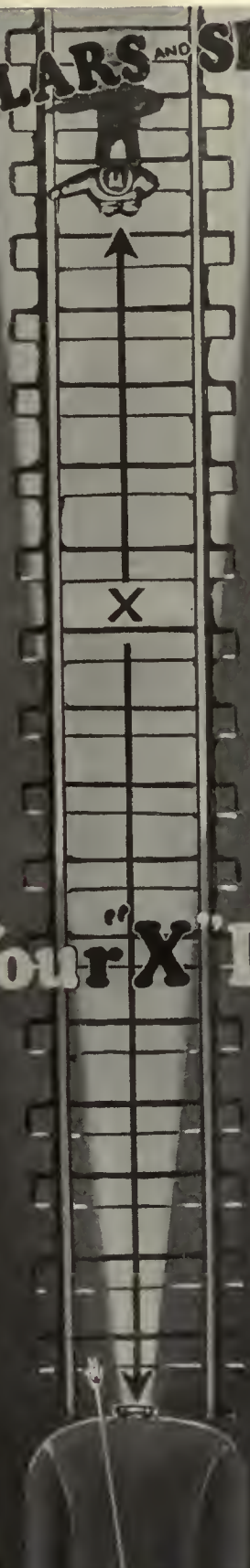


The Type SDP is a portable incandescent headlight for ordinary interurban service. 12-in. parabolic crystal or gold ray glass reflector Uses 56 to 250-watt, 115-volt lamp. Steel case. Also furnished for dash or roof mounting. Page 775, O-B Cat. No. 20.

**If "X" = 1200 to 1500 Feet**



The Type DCP is a portable. high-speed interurban type incandescent headlight. Uses 500-watt lamp. 11-in. crystal ray glass reflector. Two way focusing mechanism. This headlight is being used to replace many old time Luminous Arc Headlights. Page 755, O-B Cat, No. 20.




# What is Your "X" Distance?

THE four O-B Headlights shown above are the selections of many operating men for their particular track illumination problems. Each light has been successfully used for a different specific type of service. Each has demonstrated an ability to provide the "pick-up"—the "X" distance necessary for the type of service for which it is designed.

How long must your "X" distance be? That dimension will be best served by the O-B Headlight which operators have indicated by their choice for similar track illumination requirements. While atmospheric conditions, voltage variations and the human element vary the distances specified, the selection of an O-B Headlight to properly perform under normal conditions is the best answer to the question, "What is your 'X' distance?"

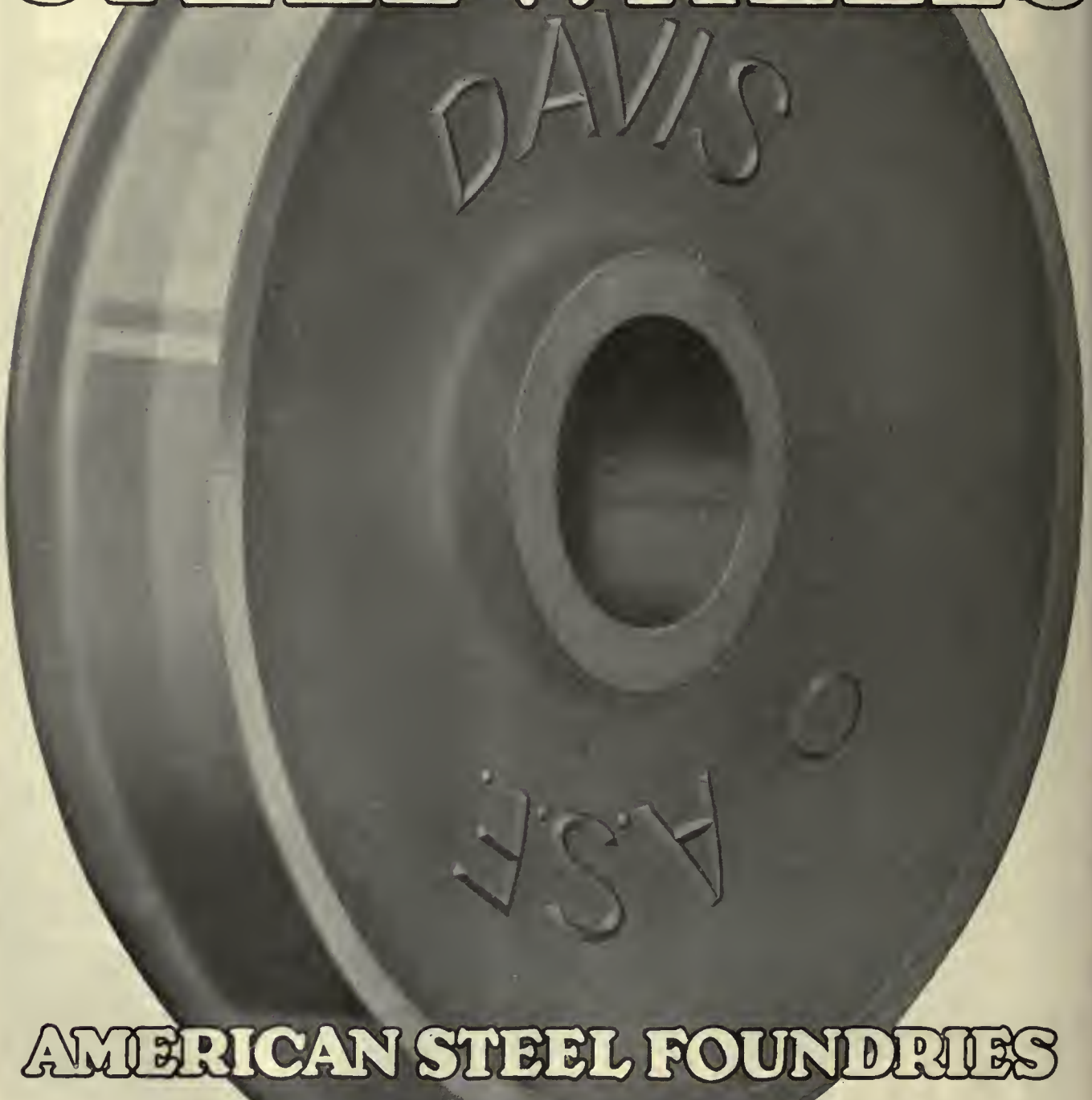
**Ohio Brass Company, Mansfield, Ohio**
Canadian Ohio Brass Co., Limited
Niagara Falls, Canada
1000D

# Ohio Brass Co.

NEW YORK CHICAGO PHILADELPHIA PITTSBURGH ATLANTA CLEVELAND SAN FRANCISCO LOS ANGELES

PORCELAIN INSULATORS
LINE MATERIALS
RAIL BONDS
CAR EQUIPMENT
MINING MATERIALS
VALVES

# DAVIS
## "ONE-WEAR"
# STEEL WHEELS




## AMERICAN STEEL FOUNDRIES

NEW YORK ST. LOUIS

CHICAGO

# TIME-TESTED *by* THOUSANDS *of* MILES *of* SERVICE

Shelby seamless trolley poles are manufactured in two standard designs known as Style A and Style B, both being 1½ inches in diameter at the butt. To meet unusually severe conditions where high trolley pressures are necessary a special extra heavy pole having a two-inch butt is recommended.



Shelby poles are made of No. 13 gauge seamless cold drawn steel tubing. This section is 1 inch outside diameter, reamed inside to ¾ inch to receive harp, or 1 inch outside, if specified for socket type harp.

This section in all Shelby poles is 6 inches long and is tapered gradually from 1 inch diameter to a diameter of 1⅜ inches.

This section is 18 inches long and 1⅜ inches in diameter, in all poles merging into 1½ inch section in Styles A and B poles and 1⅝ inch in special poles, with fillets of large radii.

In Styles A and B poles this section is 1½ inches outside diameter and varies in length according to the total length of the pole; the outside diameter of the butt is 1½ inches, and reinforcement, due to method of insertion, is practically integral with body of the pole. In special 2 inch poles, this section is 2 inches outside diameter.

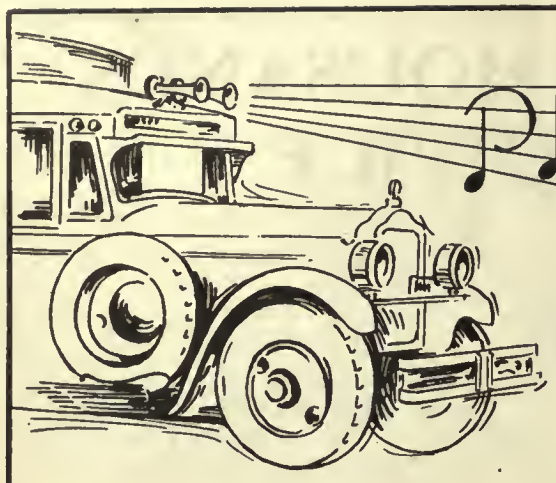
The length of the reinforcing member in a Style A pole is 16 inches and in a Style B pole and also in special 2 inch poles it varies according to the total length of the pole.

All Shelby poles are specially tested before leaving the factory. They are uniform in quality and most reliable. *Write for complete data.*

Home office and plant at 17th & Cambria Sts., PHILADELPHIA; District office at 111 N. Canal St., CHICAGO; 50 Church St., NEW YORK; Bessemer Bldg., Pittsburgh; 88 Broad St., Boston; General Motors Bldg., Detroit; 316 N. Washington Ave., Scranton; Canadian Agents, Lyman Tube & Supply Company, Ltd., Montreal, Toronto, Vancouver.

ELECTRIC SERVICE SUPPLIES CO.

MANUFACTURER OF RAILWAY, POWER AND INDUSTRIAL ELECTRICAL MATERIAL



PNEUPHONIC

# Sounding a NEW NOTE in WARNING SIGNALS





The Westinghouse Pneuphonic Horn uses very little air, operates successfully over a wide range of pressures, and is of sturdy and durable construction. It is available in single tone or chime design.

As your bus skims over the highway or ambles through traffic its warning signal must appeal for the right of way in tones that are positive but pleasing. It must be heard—it must not be harsh. Those who step out of your way today may want to step into your bus tomorrow—their good will should be retained.

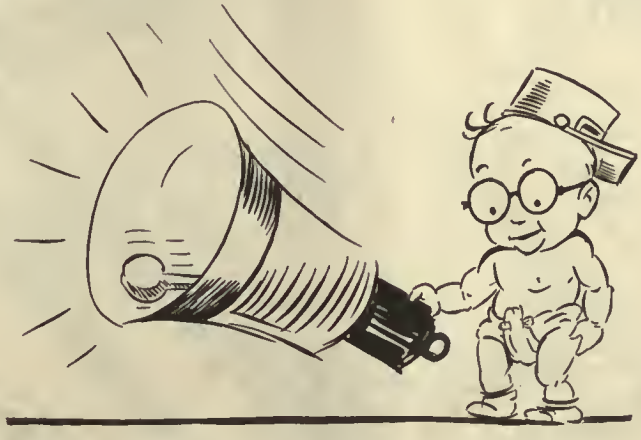
Here is a device that gives warning of approach, unmistakable, yet not irritating or startling. Its tone is loud, clear, and harmonious, easily distinguished from ordinary highway noises, and distinctly audible over a wide area.

## The PNEUPHONIC HORN

*Write us for information and prices.*

**WESTINGHOUSE AIR BRAKE COMPANY**

*Automotive Division - - - - - - - - - Wilmerding, Pa.*



# Ring Out The Old!

## A Happy New Year to You All!

FAR be it from us to commercialize holiday greetings by insisting that Steel Twin ties will solve your 1929 track building problems.

But when the time comes for serious thinking about your 1929 track building program, allow us the opportunity to tell you about Steel Twin ties and modern track building machinery.

HAPPY NEW YEAR!

**The International Steel Tie Co.**
**Cleveland, Ohio**




# Cold weather requires *a fighting* gasoline

ZERO weather, wind and snow—a winter combination that tests to the limit the fuel you use in your buses. Gasoline to be dependable under such conditions, must possess to a high degree every feature essential to a good gasoline—quick starting in cold weather, proper arrangement of boiling point fractions assuring maximum development of power, economical mileage.

Red Crown Gasoline meets every one of these requirements. It is noted for its quick starting qualities. Low initial boiling point assures quick vaporization, so that the spark catches promptly.

Red Crown Gasoline is further characterized by the perfection of its chain of boiling point fractions, giving quick acceleration, maximum power and clean combustion. This is why Red Crown causes less dilution of oil in cold weather, why it gives more mileage per gallon.

If you would maintain your winter schedules; if you would reduce your winter operating expenses to the lowest possible point, Red Crown as a factor in accomplishing this surely deserves your consideration. Test it in one of your buses against any other fuel—prove to yourself that it is the most efficient and economical fuel—winter or summer.

STANDARD OIL COMPANY
(INDIANA)

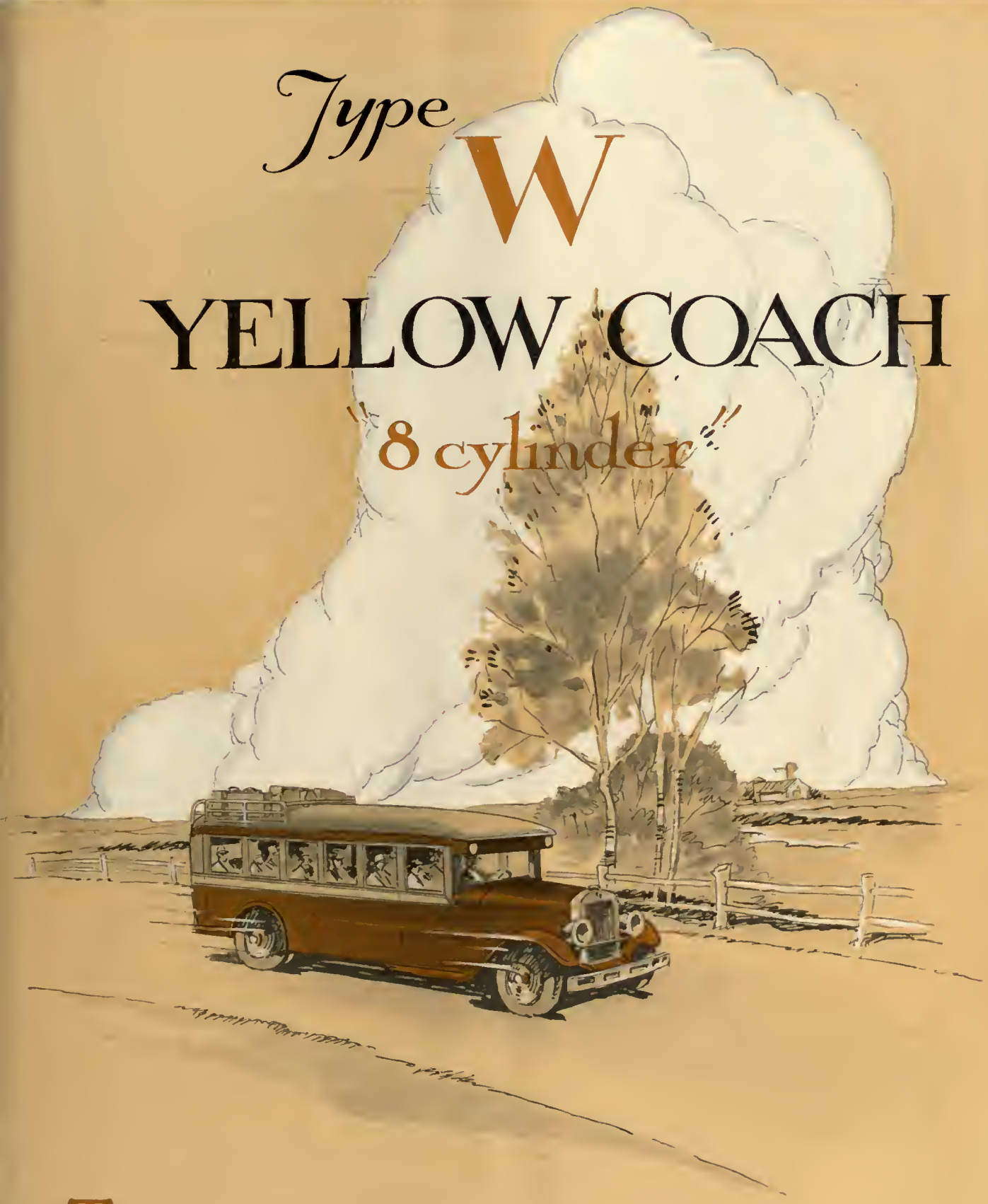
*General Offices:* 910 South Michigan Avenue Chicago, Ill.

811

# *Type* W

# YELLOW COACH

## "8 cylinder"



TWO years of intensive engineering development, research and refinement, backed by the vast research laboratories and testing facilities of the General Motors Corporation, were required to develop a small vehicle, that would measure up in every particular to the high standards of excellence that are characteristic of larger Yellow Coach models.

Now, in every detail of design and construction—power plant, axles, frame, brakes, springs and body—we present a coach whose satisfactory performance and lasting qualities meet every Yellow Coach engineering tradition.



*The full head-room 21-passenger City Service Coach*

# Combining Beauty *with* Practical Utility

THAT a full head-room coach can possess the distinctive grace of line and balanced proportions of a parlor coach, without sacrificing carrying capacity and head-room, is well proven in the design of the Type "W" City Service Coach.

Practical operating utility has been carefully combined with the features that attract and please passengers. In the building of Type "W" bodies, great care is exercised in the selection of materials and in the methods of assembly and construction. The frame work is built of thoroughly seasoned second growth ash. The exterior is covered with aluminum. There are no exposed wooden parts. Accurate uniformity and fit are assured by building and assembling each individual body section over precision jigs and fixtures.

This modern method of sub-assembly, while too costly for small production, is justified where volume can offset the high initial investment in jigs and fixtures. It results in the highest degree of accuracy and precision fit, and guarantees a well built body of lasting qualities. Furthermore, it insures freedom from squeaks and rattles.

The entrance door of the City Service Coach is of the jack knife type and is built of steel—another advance in lasting body construction. Being built over jigs and fixtures permanent alignment and perfect fit is assured. Furthermore, it is lighter, stronger, free from rattles and will resist warping and twisting.

An important passenger requirement in city service operation is maximum visibility, good ventilation and heating, hence the careful planning of these three factors.



*A practical rear of graceful proportions and pleasing lines*



*Good visibility for the passengers and every convenience for the driver. Fittings by Ternstedt*

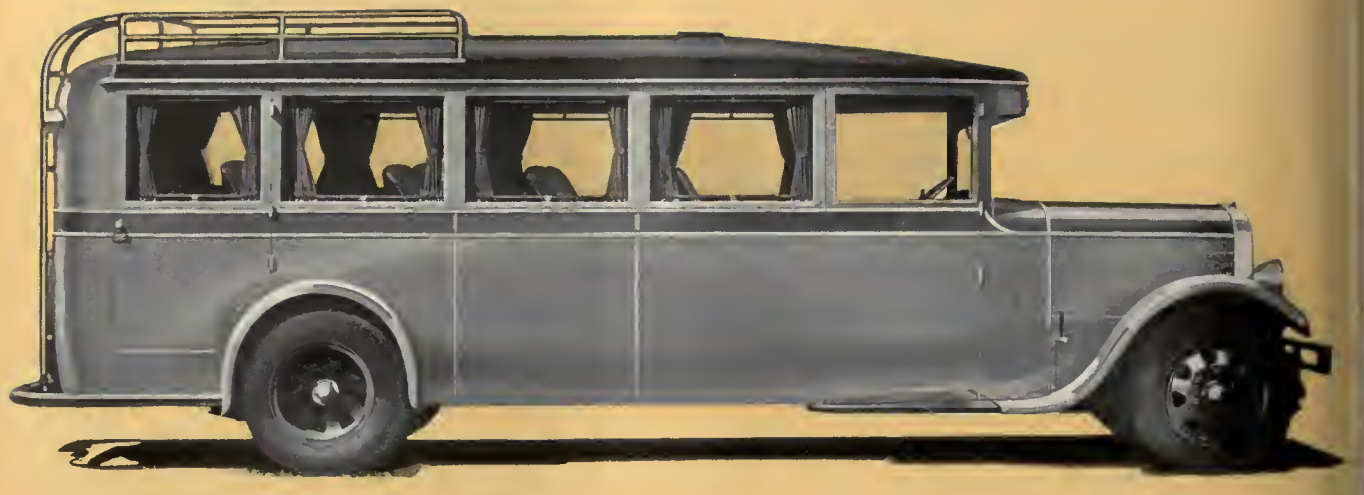
Windows are of the raised type, with fixed upper transoms, which permit of an exceptional high range of lift. Large ventilators are set in the roof and added circulation is provided by three large cowl ventilators. Heating is supplied by a blower system that eliminates all pipes within the body. An electric switch on the dash controls the entire heating system.

The body wiring is conveniently located under the advertising racks and is removable as units. All body wiring is carried to one terminal block on the chassis to simplify the joining of chassis and body circuits.

The full head-room body can be easily converted into a beautiful semi de luxe 21-passenger vehicle by installing parlor car chairs and window drapes, at a small extra cost.



*There are generous accommodations for 21 seated passengers. The seats are well shaped, comfortable, strongly built and attractively upholstered in genuine brown leather. An alternative arrangement is the use of longitudinal seats over the wheel housings, providing accommodations for 23 seated passengers*



*The 17-passenger Parlor Coach*

# The Parlor Coach

THE 17-passenger parlor coach was designed to approximate in every detail the performance and desirable features usually associated with the finest of personal motor cars. It is thoroughly modern in every detail of appearance and provision for passenger comfort and convenience. Its speed, acceleration and all-round performance can truly be compared with America's finest motor cars.

It is built with a narrow overall width (only 84 inches) to permit greater flexibility of operation and speed on narrow highways and in heavy city traffic.

17 passengers can be accommodated with more than ordinary comfort. All chairs are finely and strongly built of tan colored fibre, upholstered in rich green Spanish leather. On the left side are four high-backed double chairs, and on the right, four high-backed single chairs. The rear lounge seat accommodates four. At the driver's right is a folding observation chair.



*The rear of Parlor Co Beauty of pearance is bined with p tical utility. emergency is on the side at the*



*An attracti and comfortable feature . . . un usually high (4 in.) back chairs Fittings b Ternstedt*



*At the driver's right is a folding observation chair*

At a slight extra cost, an alternative seating arrangement can be had by installing special seats that unfold intothe aisle space, accommodating four additional passengers.

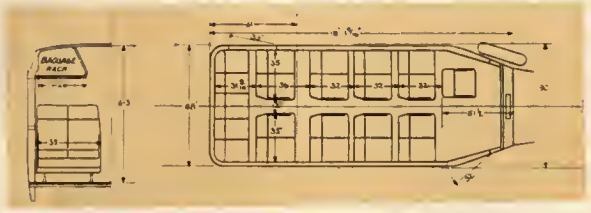
Following established practice in the fine motor car field, the interior side panels are finished in mohair, and the roof head-lining is of velour. Plate glass windows have smart looking drapes, sliding on chromium plated rods.

## The Observation Parlor Coach

AS IN the City Service Coach, all body sections are precision built over special jigs and fixtures.

The Type "W" Observation Coach closely resembles the Parlor Coach in its appointments, trim and construction, but was designed to provide a full width (90 in.) full head-room (6 ft. 3 in.) Parlor Coach that will easily accommodate 21 seated passengers.

It has the same comfortable high back chairs as the Parlor Coach, but with four double chairs on each side of aisle.

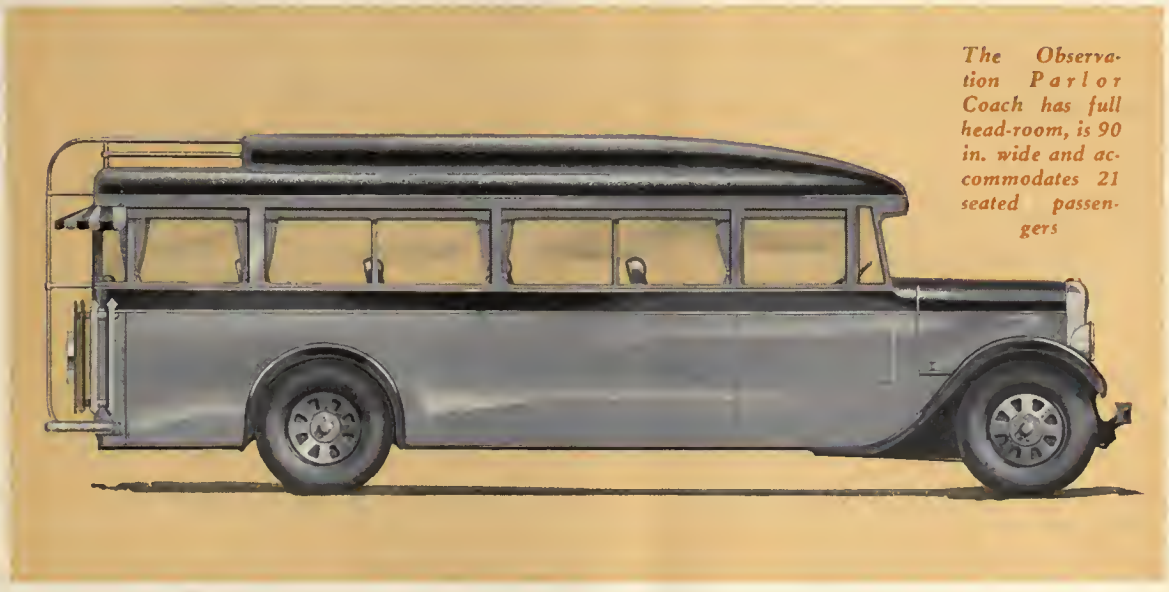


*The Observation Parlor Coach has two rows of double*
*The Observation Coach has two rows of double*

A Monitor type of roof was used to provide interior baggage racks of generous proportions. An exterior luggage rack provides further accommodations for excess baggage and special express service.

Wherever possible, aluminum has been used in order to combine durability and strength with lightness of weight. The fittings are by Ternstedt.

The observation rear has been carefully planned to insure the utmost in visibility for passengers.



*The Observation Parlor Coach has full head-room, is 90 in. wide and accommodates 21 seated passengers*



*New in small coach design— an underslung worm drive*



TO UNDERSTAND how completely the new Type "W" supplies those advantages of performance and construction usually found only in the most costly large capacity coaches, consider these important features—

The famous Cadillac 8-cylinder, V type power plant, modified to meet motor coach requirements.

Four-wheel, four-segment service brakes with vacuum Booster, operating through an entirely new method of hydraulic synchronized application, insuring powerful and instantaneous brake action, with minimum effort.

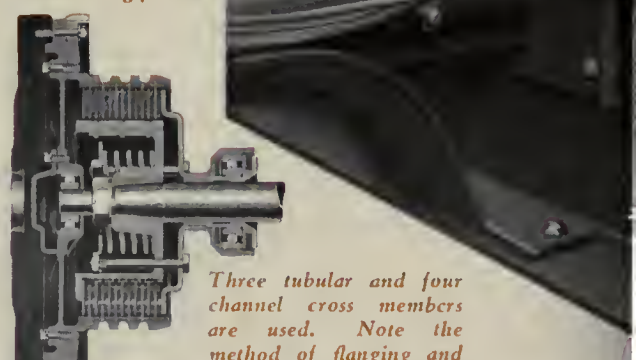
An underslung worm-driven rear axle, of over-size capacity.

A frame of unusually rigid construction, employing seven cross members, three of which are tubular. The side rail members are of 1/4-in. pressed steel, with a maximum depth of 8 inches.

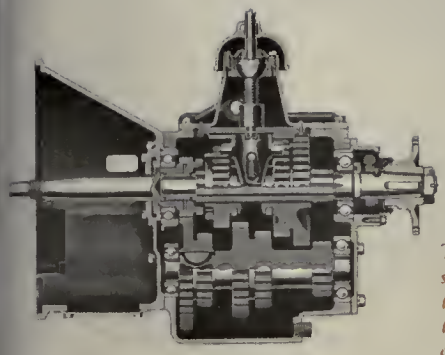
A new front spring suspension that results in exceptional roadability, excellent riding qualities, easy steering, and minimum maintenance. This is accomplished by the outboard mounting of the front springs, which are shackled at the front to a heavy channel cross member outside the chassis frame, instead of directly under it.



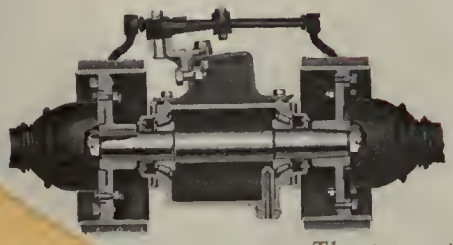
*Multiple disc clutch is cooled by induced air currents and has special lubricating features*



*Three tubular and four channel cross members are used. Note the method of flanging and double bracing to insure rigidity*



*The specially designed four-speed transmission contributes to swift acceleration and quiet operation*



*The two external contracting brake bands are anchored on either side of the center bearing housing*

The result is a lower frame level, wider spring centers, better balance, relief to wheel bearings, and protection to steering gear from heavy road shocks, and the elimination of any tendency of spring action to throw the steering gear out of alignment.

All spring mountings are adjustable, of a new patented design which eliminates the common two-piece shackle, and simplifies adjustment and maintenance.

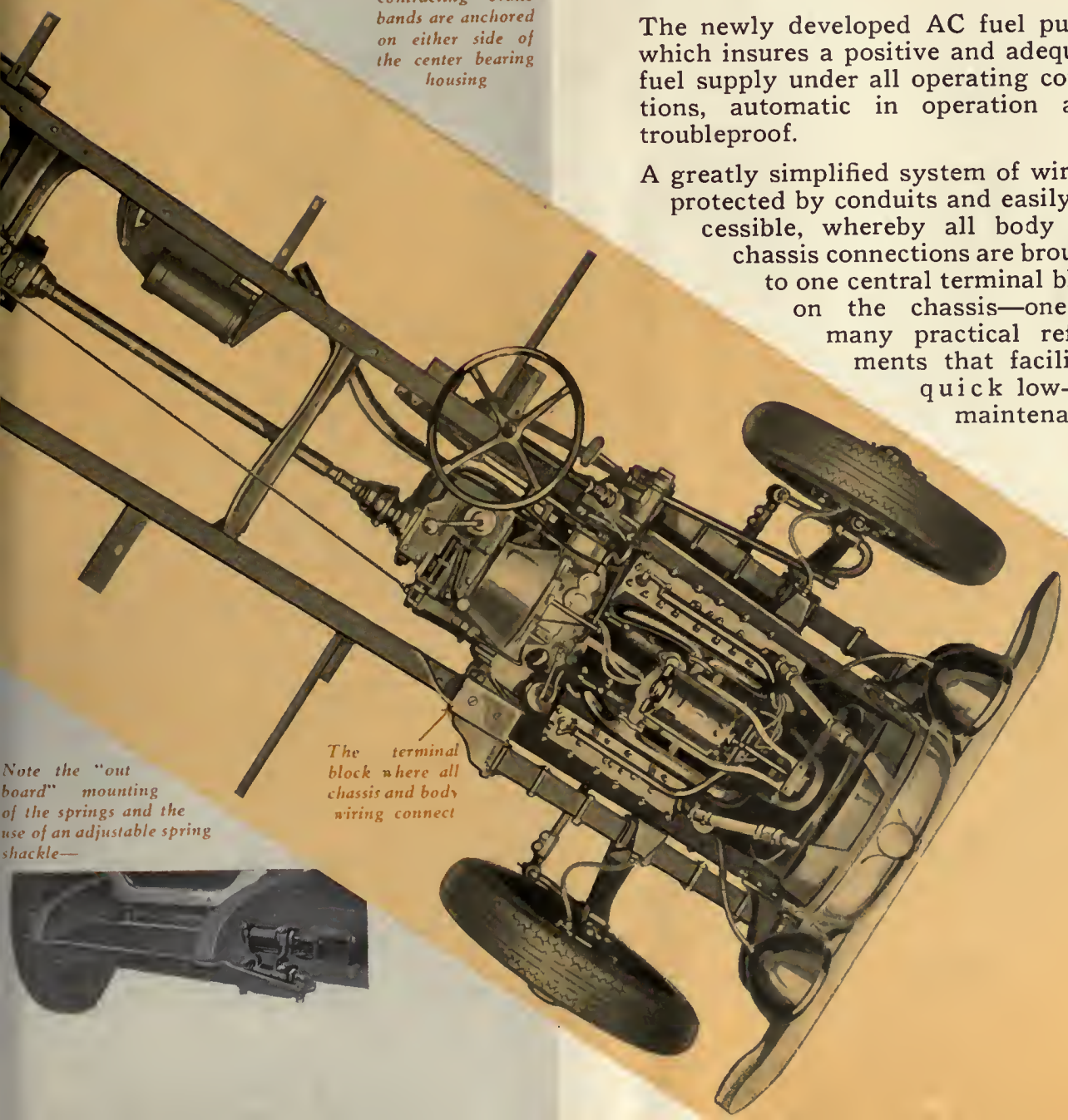
A four-speed transmission, new in small coach design.

The fastest, easiest steering ever known in a coach of this capacity.

A vertical tube radiator, of 518 cubic inch frontal area and nine gallon capacity. Core specially shrouded to increase air cooling.

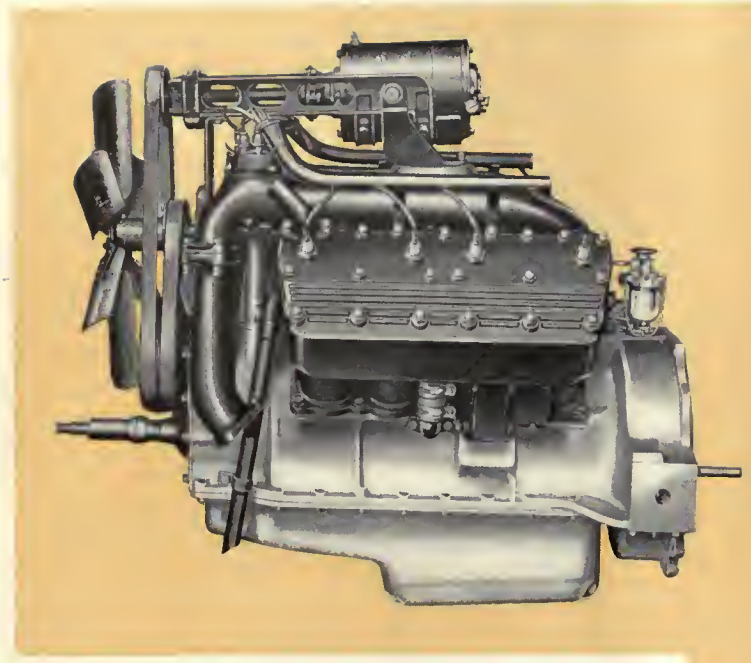
The newly developed AC fuel pump, which insures a positive and adequate fuel supply under all operating conditions, automatic in operation and troubleproof.

A greatly simplified system of wiring, protected by conduits and easily accessible, whereby all body and chassis connections are brought to one central terminal block on the chassis—one of many practical refinements that facilitate quick low-cost maintenance.



*The terminal block where all chassis and body wiring connect*

*Note the "out board" mounting of the springs and the use of an adjustable spring shackle—*



*The famous Cadillac Engine modified to meet the requirements of motor coach service. 341 cu. in. displacement*

*Note that the 12-volt generator is easily accessible and well ventilated*



THE same wonderful source of tremendous power, fast acceleration, smooth flexibility and freedom from vibration that gained for Cadillac its world-wide reputation for unexcelled performance is used in the Type "W" Yellow Chassis.

The V-type, 8-cylinder engine, as modified to meet the requirements of transportation service, is ideally suited to small coach construction.

It is very compact, and yet all units are easily accessible. The short engine length makes possible a greater useful loading space for a given overall length.

It is mechanically simple. Two short cylinder blocks paralleling one another insure highly efficient and simplified cooling, better carburetion, fuel distribution and lubrication.

It has long life. All units that are subjected to high stresses, such as crankcase, crankshaft, camshaft and cylinder blocks, are short and consequently very rigid. Their useful life, therefore, is greatly increased.

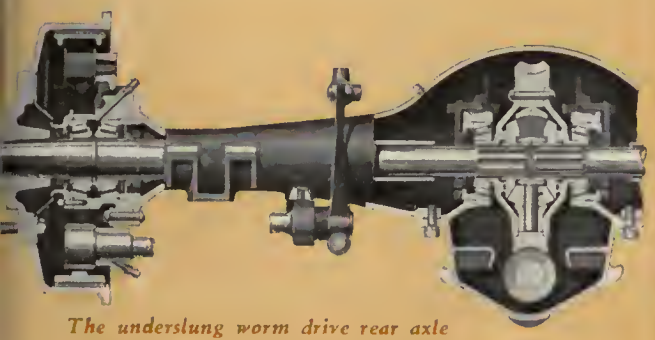
There is no tendency for the short crankshafts and short camshafts to whip. Three main bearings support the crankshaft in precise alignment, as against the seven or nine required in engines of greater length. Only four crank throws are required, where other engines require one for each cylinder. Compensating weights permanently attached to the crankshaft give inherent balance.

With this design the power impulses are equally spaced and are equally overlapping. Smooth power is assured whatever the engine speed.

Furthermore, it weighs less for its rated horsepower than a six or straight line eight of similar piston displacement.

Another notable development new in small coach design is the use of an oversize, underslung, worm-drive rear axle.

Exceptional strength, a safety factor far in excess of normal requirements, and many features calculated to facilitate maintenance, characterize the entire design of this important unit.



*The underslung worm drive rear axle has an unusually high factor of safety to take care of maximum loads*

The worm shaft is mounted in a carrier on two opposed taper roller bearings at the rear end, and a straight type roller bearing at the forward end. The rear bearing takes fore and aft thrust of the worm shaft in addition to the radial load. The front bearing takes radial load only. The bronze worm wheel is riveted to the differential case.

The front axle is of the reverse Elliott type, with I-beam section. The load thrust is taken on roller bearings interposed between the axle end and the lower fork of the steering knuckle, as well as on the wheel bearings. The pivot pin and wheels are slightly inclined in order to provide for better steering and roadability.

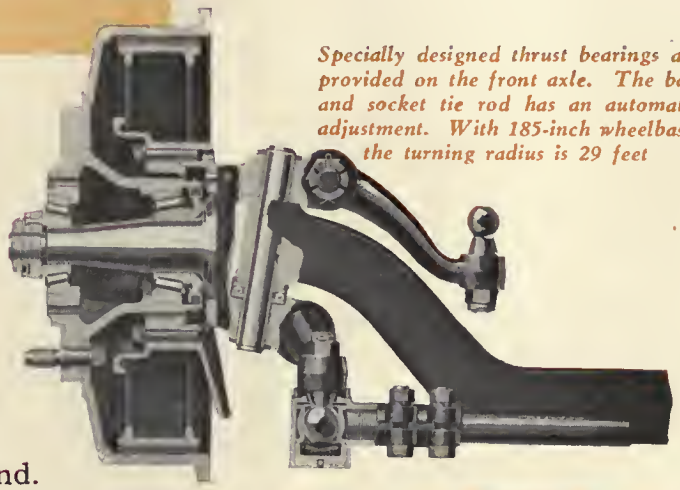
The front axle steering tie rod is of the heavy self-adjusting ball and socket type. Wear is automatically compensated for.

The steering gear is of the cam and lever type, with provision for easy adjustment or quick removal.

Careful attention has been paid to caster and camber, as well as to all other factors that are of vital importance in influencing easy steering and simplicity of adjustment.

The four-wheel service brakes employ a vacuum booster with hydraulic control to actuate the mechanical-type brakes.

A new type of hydraulic control was first



*Specially designed thrust bearings are provided on the front axle. The ball and socket tie rod has an automatic adjustment. With 185-inch wheelbase, the turning radius is 29 feet*



*A special housing for the cam-and-lever steering gear was designed for more rigid fastening to the frame. It eliminates wheel and steering column wobble*

developed, in which the operating cylinders were reduced in diameter and mounted away from the wheels, so that they would be easily accessible, well ventilated and removed from any destructive heat generated by the brakes. To this was added a vacuum booster. This construction combines the light pedal pressure of the booster, the smooth efficiency, and the perfect brake equalization of the hydraulic, with all the desirable advantages of four-wheel mechanical-type brakes.

Adjustments for wear are exceedingly simple, and no equalization adjustment is necessary. Due to the even pressure maintained, and the unusually large braking area, brake lining life is exceedingly great. Brake drums are of gun iron, 16⅛ in. in diameter, ground to a perfect fit and balanced after being machined outside as well as inside. The combined service and emergency brake area amounts to 836 square inches, or nearly six square feet.

The emergency brake mechanism is a duplex propeller shaft brake entirely independent of the four-wheel service brakes. These two 8-in. gun iron drums are 3½ in. wide. Brake bands are external contracting, operated by hand lever.

Summed up, service brakes in the Type "W" combine these specific advantages—

Powerful and smooth braking action, with very slight pedal pressure.

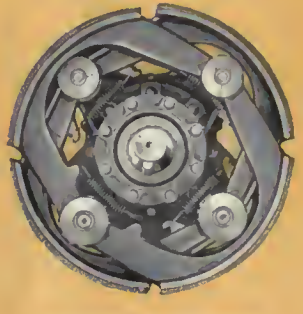
Perfect automatic equalization of brake pressures on all four wheels.

Adjustment for brake lining wear is exceedingly simple, quick and accurate.

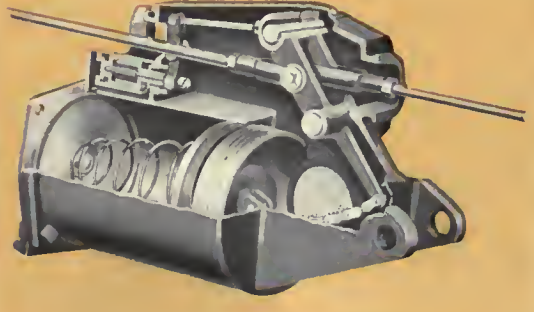
Low maintenance cost.

Easy accessibility and simplicity.

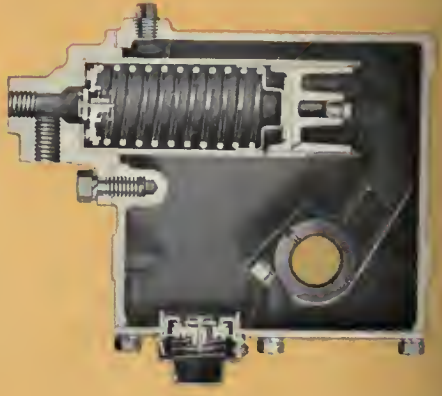
*Each service brake contains four fabric lined shoes, interchangeable front and rear. Drums are of gun iron, machined and balanced*



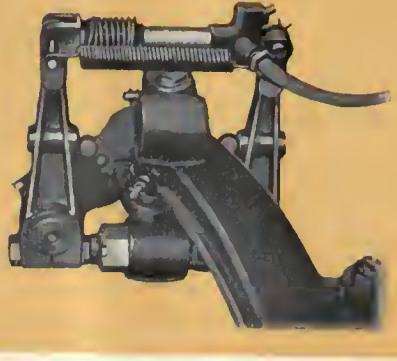
*The vacuum booster "steps-up" the brake action and gets quick and positive results with light pedal pressure*



TYPE W



*The hydraulic master cylinder is self-compensating type. The rubber cup in the entire system used here*



*The simplified operating cylinders of the hydraulic control that actuate the brake mechanism. They are mounted away from the wheels and are consequently well ventilated and accessible*

# TYPE "W" SPECIFICATIONS

## Chassis

**GENERAL DIMENSIONS**
Wheelbase, 185 in.
Dash to C/L. Rear Axles, 156 5/16 in.
Frame height from ground loaded, 21⅜
Frame width—Front, 30 in.
Frame width—Rear, 41½ in.
Track—Front, 69⅞ in.
Track—Rear, 65¼ in.
Turning radius, 28 ft. 3 in.
Overall width over rear tires, 81⅜ in.

**ENGINE**—Modified Cadillac V-8 cylinder, 3 1/16 in. bore, 4 1/16 in. stroke, 341 cu. in. displacement.

**Fan**—21 in. diameter, 6 blades mounted on roller bearings. V belt with adjustment.

**Lubrication**—Force feed to main bearings and connecting rods. Oil pump attached to crankcase top half and positively driven from spiral gear on cam shaft.

**Water Circulation**—Centrifugal Pump, gear driven.

**Oil Cleaners**—A.C. Type.

**Carburetion**—Special designed multiple jet plain tube type with adjustment for low and high speed.

**Exhaust Manifold**—Single porcelain enameled cast iron manifold on each cylinder block connected by Y branch to single exhaust pipe.

**Crankshaft**—Heat treated, statically and dynamically balanced. 3 main bearings, 2⅜ in. diameter; connecting rod bearings 2⅜ in. diameter.

**Crankcase**—Upper and lower halves aluminum with rigid webbing.

**Ignition**—Delco, battery type, 12 volt, automatic advance with two breakers, one breaker adjustable for synchronizing.

**Battery**—100 ampere hour, 12 volt, rubber case. Leads carried to side of case with special terminals.

**Generator**—Delco, 12 volt, 300 watt capacity. Automatic voltage regulation.

**Starting Motor**—Delco, 12 volt. manual shift.

**RADIATOR**—Vertical copper finned tube chromium plated shell.

**CLUTCH**—Multiple disc type, cooled by induced air current. Fabric friction linings. Adjustable and easily replaced.

**CONTROL SET**—Gear shift lever mounted directly on transmission at right of driver. Emergency brake lever at right of driver.

**TRANSMISSION**—Four speed selective, unit type mounted on engine flywheel housing.

**PROPELLER SHAFTS**—Tubular shafts with grease type metal joints. Center support bearing self contained, wide spacing between roller bearings; of sturdy construction to take propeller shaft brake stresses; large oil capacity.

**STEERING GEAR**—Cam and lever, mounted on top of frame, 19 in. wheel.

**FRAME**—Rigid, pressed steel side bars with kick up over rear axle. Seven cross members, three of which are tubular. Maximum side bar depth 8 in. Maximum flange width 3 in. Frame ⅛ in. thick.

**FRONT SPRINGS**—Heat treated alloy steel, semi-elliptic 43 in. long, 3 in. wide. Shackled at front end.

**REAR SPRINGS**—Heat treated alloy steel, semi-elliptic 58 in. long, 3 in. wide.

**SPRING MOUNTING**—Metal shackle type. pins 1 in. diameter, wide adjustment on all shackles.

**FRONT AXLE**—Reverse Elliott. Wheel loads taken on specially designed thrust bearings. Taper roller wheel bearings. Ball and socket tie rod, with automatic adjustment.

**REAR AXLE**—Underslung worm and wheel with cast steel housing. Axle semi-floating. Bearings taper roller with shim adjustment. Worm wheel bronze.

Ratios as follows:— 5.00-1 6.00-1 (Standard)
5.4-1 7.00-1

**BRAKES—Service:** 4-wheel hydraulic internal expanding type employing a Westinghouse Booster unit. Each brake drum has four fabric lined shoes simultaneously operated giving approximately even pressure all around drum: drums 16⅛ in. dia., shoes 2¼ in. wide; operating cylinders placed outside of drums keeping them free from all braking heat. Master cylinder arranged to automatically replace any leakage or fluid. **Emergency:** External contracting hand brake working on twin brake drums one on each end of propeller shaft center bearing, mechanically operated by pull-on type hand lever.

**WHEELS**—Pressed steel disc, cast steel hubs. Dual rear. Rims 20 in. dia.

**TIRES**—34x7.50 balloons, front and rear.

**GASOLINE TANK**—Capacity 46 gallons. Located and supported in rear end of frame.

**GASOLINE FEED SYSTEM**—A.C. Fuel Pump with integral strainer.

**STANDARD ELECTRICAL EQUIPMENT**—Ammeter, voltage regulator, reverse current cut-out, lighting, buzzer and ignition switches and heat indicator.

**STANDARD CHASSIS EQUIPMENT**—Front bumper, head lamps front fenders, hood, electric horn, tail and stop light, one extra disc wheel, speedometer, oil gauge and tools.

## 21-Passenger City Service Body

**GENERAL DIMENSIONS**
Coach length over bumpers—23 ft. 8 in.
Overall length of body—18 ft. 1⅜ In.
Overall width of coach—90 in.
Overall height (full load)—8 ft. 7⅜ in.
Head-room inside body—76½ in.
Floor height (loaded)—25⅜ in.
Height of step from ground (loaded)—13⅜ in.

**SEATING ARRANGEMENT**—Twenty-one passengers all facing forward. Eight double seats—4 on each side. Cross seat at rear seating 5. Bucket type driver's seat.

**CONSTRUCTION**—Framework of second-growth, thoroughly seasoned ash, braced and jointed in conformity with best body-building practice. All joints treated with white lead or glue and either screwed or bolted.

**ROOF**—Formed from slats, over ash car-lines, covered with black top decking. Construction extremely rigid and waterproof. Inside veneer.

**PANELS**—Entire exterior covered with sheet aluminum. No exposed wood members. Panels individual and readily detachable.

**WINDOWS**—Raised type, with fixed upper transoms. 15¾ in. window lift. Sash of drawn brass providing maximum window vision and minimum weight. Equipped with anti-rattling devices and held to adjustable heights by racks and locks. Sash glazed with double strength window glass. Sash, glass and guides easily removable as a unit, 29⅞ in. post spacing.

**ENTRANCE DOOR**—Jack-knife type, steel, opening outward. Operated from driver's seat by adjustable mechanism. Upper door panels of glass. Entrance step incorporating safety tread.

**EMERGENCY DOOR**—Located at left side. Equipped with safety lock.

**INTERIOR FINISH**—Below belt rail—special composition recessed panels. Brown finish. Mahogany molding. Roof—white enamel. Floor covered with special waterproof composition.

**SEATS**—Upholstered in genuine brown leather. Full sprung cushions and backs. Light pressed steel pedestals. Seats fitted with polished grab-handles. Seat width 33 in.; aisle width 18¾ in. at cushion and 21¼ in. at seat back; seat spacing 30 in. to 33 in.

**HEATING SYSTEM**—Blower system. Air circulated around multitubular unit heated by exhaust gases. Controlled by switch on instrument panel.

**VENTILATORS**—Three large ventilators located in roof. Three ventilators in cowl.

**WINDSHIELD**—Plate glass with metal frame. Ventilating panel at top equipped with windshield wiper.

**WIRING**—Cables of stranded wire type, rubber and fabric covered. All exposed wiring protected with loom or metal conduit.

**INTERIOR LIGHTING**—Eight dome lights of 21 C.P. Light wiring self-contained in advertising racks and removable as a unit. Destination sign illuminated by three 4 C.P. bulbs. Signal buttons at each seat.

• Curtain, at rear of driver's seat.

**ADVERTISING SPACE**—Standard 11 in. wide advertising sign rack along upper part on both sides and rear of body, mahogany finish.

**SUN VISOR AND DESTINATION SIGN**—Hunter roller type. Size 8 in. x 40 in. Lettering space 6 x 36 in. Lettering optional. Sun visor located below destination sign.

**STANCHIONS**—Grab-rail in vertical position at entrance door.

**REAR VISION MIRROR**—Located on panel above and in front of driver.

**LIGHTS**—Front and rear marker lights with optional lens colors. Step light at entrance door.

**BUMPERS**—Tube type rear bumper and channel front bumper.

**TIRE CARRIER**—One spare tire carrier at rear.

**PAINTING**—Optional as to colors.

**LETTERING**—Extra charge for lettering, monograms, gold and silver leaf striping.

# TYPE "W" SPECIFICATION

## 17-Passenger Parlor Car Body

**GENERAL DIMENSIONS**
Overall length over bumpers—23 ft. 8 in.
Overall length of body—18 ft. 1⅞ in.
Overall width of coach—84 in.
Overall height (full load)—7 ft. 10⅜ in.
Head-room inside body—68 in.
Overall height body including luggage rack—8 ft. 8¼ in.
Floor height (loaded)—25⅛ in.
Height of step from ground (loaded)—13⅜ in.

**SEATING ARRANGEMENT**—Seventeen passengers, all facing forward, accommodated in four rows of double seats on left side and four rows of single seats on right side of coach, a rear cross seat for four and an observation seat (hinged) alongside driver.

**CONSTRUCTION**—Same as in city service body.

**ROOF**—Formed from slats, over ash car-lines, securely fastened in place. Corners hammered aluminum. Roof covered with black top decking. Construction extremely rigid and waterproof.

**PANELS**—Exterior, side and rear covered with heavy gauge metal. No exposed wood members.

**WINDOWS**—Window post spacing 39 7/16 in. Glass ¼ in. plate, frameless, sliding in felt channels. All side and door windows of drop type, operated by Ternstedt heavy duty crank type regulators fitted with anti-rattlers. Rear window stationary.

**ENTRANCE DOOR**—Sedan type, 34 in. wide, opening outward controlled by adjustable mechanism from driver's seat. Entrance step incorporating safety tread.

**EMERGENCY DOOR**—Sedan type, 34 in. wide, opening outward, located at rear on left side of coach, fitted with safety lock.

**BAGGAGE DOOR**—Sedan type, 34 in. wide, opening outward, located at rear on right side of coach.

**LUGGAGE RACK**—On roof at rear—three bar type with folding steps and grab-rails at side of coach.

**INTERIOR FINISH**—Lower side panels of waterproof metal board covered with mohair. Roof headlining of velour. All hardware bright chrome finish. Floor covered with linoleum.

**CHAIRS**—De Luxe type, tan colored fibre chairs with arm rests. Detachable double cushions. Chair back cushions and arm rests all upholstered in genuine green Spanish leather. Double chair width over arm rests 38 in. Single chair width over arm rests 22 in. Chair spacing 30 to 39½ in. Aisle width at arm rests 14 in.

**HEATING SYSTEM**—Blower system. Air circulated around multitubular unit heated by exhaust gases. Controlled by switch on instrument panel.

**VENTILATORS**—Three roof ventilators of large capacity. Three ventilators in cowl.

**WINDSHIELD**—Plate glass with metal frame. Ventilating panel at top equipped with windshield wiper.

**WIRING**—Cables of stranded wire type, rubber and fabric covered. All exposed wiring protected with loom or metal conduit.

**INTERIOR LIGHTING**—Eight 21 C.P. dome lights. Signal cord at each seat.

**CURTAINS**—Window drapes at side and rear windows sliding on chromium plated rods. Curtain at rear of driver's seat.

**SUN VISOR AND DESTINATION SIGN**—Sun visor metal fixed type. Built-in illuminated destination sign. Roller Hunter type. Lettering optional.

**REAR VISION MIRROR**—Located on panel above and in front of driver.

**LIGHTS**—Front and rear marker lights with optional lens colors. Step light at entrance door.

**BUMPER (Rear)**—Tube type rear bumper and channel front bumper.

**TIRE CARRIER**—One spare tire carrier at rear.

**PAINTING**—Optional as to colors.

**LETTERING**—Extra charge for lettering, monograms, gold and silver leaf striping.

## 21-Passenger Observation Parlor Car Coach

**GENERAL DIMENSIONS**
Overall length over bumpers—23 ft. 8 in.
Overall length of body—18 ft. 1½ in.
Overall width of coach—90 in.
Overall height—101 in.
Headroom inside body—75 in.
Floor height (loaded)—24½ in.
Height of step from ground (loaded)—14 in.

**CAPACITY AND SEATING ARRANGEMENT**—21 Passenger eight double 35 in. wide fibre back chairs with headroll desig all facing forward, one cross seat at rear, seating five and i dividual driver's seat with adjustable pedestal. Aisle width in. Seat spacing 32 in.

**CONSTRUCTION**—Same as in City Service Body.

**ROOF**—Center panels of roof three-ply poplar veneer. Fron section formed to shape of roof. Roof over rear end slat con struction. Center panel and rear end covered with long gra top material. Balance of roof covered with sheet aluminum.

**PANELS**—Entire exterior covered with sheet aluminum. N exposed wood member; panels are individual and readily d tachable.

**WINDOWS**—Glass ⅛ in. plate, frameless, sliding in felt chan nels. All side windows including door windows, drop typ operated by Ternstedt heavy duty crank type regulators. Rea window stationary glazed with ¼ in. dangershield glass.

**ENTRANCE DOOR**—Sedan type opening outward, controlled b adjustable mechanism from driver's seat.

**EMERGENCY DOOR**—Located at left rear side. Equipped wit three-point lock.

**INTERIOR FINISH**—Wainscoting and pillars above be covered with leather cloth to match genuine leather used o chairs. Floor covered with battleship linoleum to harmoniz with trimming. All hardware bright nickel finished.

**CHAIRS**—Fibre chairs with arm rest on aisle side only an divided backs accommodating two passengers each. Doubl cushions. Backs to be headroll type. Cushion backs and arm rests all genuine leather.

**HEATING SYSTEM**—Same as in City Service Body.

**VENTILATORS**—Four large ventilators with stationary grill and screen in roof. Three ventilators in cowl.

**WIRING**—All wiring protected with metal conduit. All circuit of 12 volt double contact type.

**INTERIOR LIGHTING**—Interior illuminated by six (6) 1 volt 21 C.P. dome lights.

**SIGNAL CORD**—Located conveniently for each seat.

**CURTAINS**—Window drapes at side and rear windows ful width of window.

**SUN VISOR AND DESTINATION SIGN**—Sun visor, metal fixed type. Built-in illuminated destination Hunter sign with roller curtain having provision for 15 readings.

**WINDSHIELD**—Windshield, one-piece stationary, glazed with plate glass, equipped with windshield wiper.

**REAR VISION MIRROR**—Located on panel above and in front of driver.

**LIGHTS**—Front and rear marker lights with optional lens color Step light in well and on top of entrance door. Combination tail and stop light and license bracket at rear.

**OBSERVATION REAR**—Equipped with ornamental grill and awning. Center of grill equipped with illuminated disc.

**BUMPERS**—Tube type rear bumper and channel front bumper

**TIRE CARRIER**—One spare tire carrier mounted at front o coach on left side.

**OUTSIDE BAGGAGE RACK**—Baggage rack with tarpauli cover on rear of roof with ladder at rear right side.

**INSIDE LUGGAGE RACK**—A built-in luggage rack on inside of body formed by space in monitor in front section of roof o both sides of body.

**TOOL CHEST**—Under rear cross seat, accessible thru lef emergency door without disturbing rear seat cushions.

**PAINTING**—Optional as to colors. Extra charge for lettering

GENERAL MOTORS TRUCK COMPANY
PONTIAC, MICHIGAN

# RELIEVING CONGESTION
through
# TREADLE-IZATION

"*The Circulating Load*
*Uses the Rear Treadle*

The circulating load—in at the front, out at the rear door by standing on the treadle—will relieve congestion in the front end of safety cars.

Isn't that simple? It is for your convenience and if you follow that practice you will find your street car riding much more comfortable. And, too, if you move away from the entrance you often will find a vacant seat even at the rush hours of the day.

The treadle—that piece of aluminum in front of the rear exit on safety cars—operates with but a minimum of assistance from you. Just stand on the treadle and the door opens automatically when the car stops. You not only get off the car quicker, but by relieving congestion at the entrance door, help us to give you better service."

*This is the way the Georgia Power Company presents treadle-ization to its passengers.*

NP

## NATIONAL PNEUMATIC COMPANY

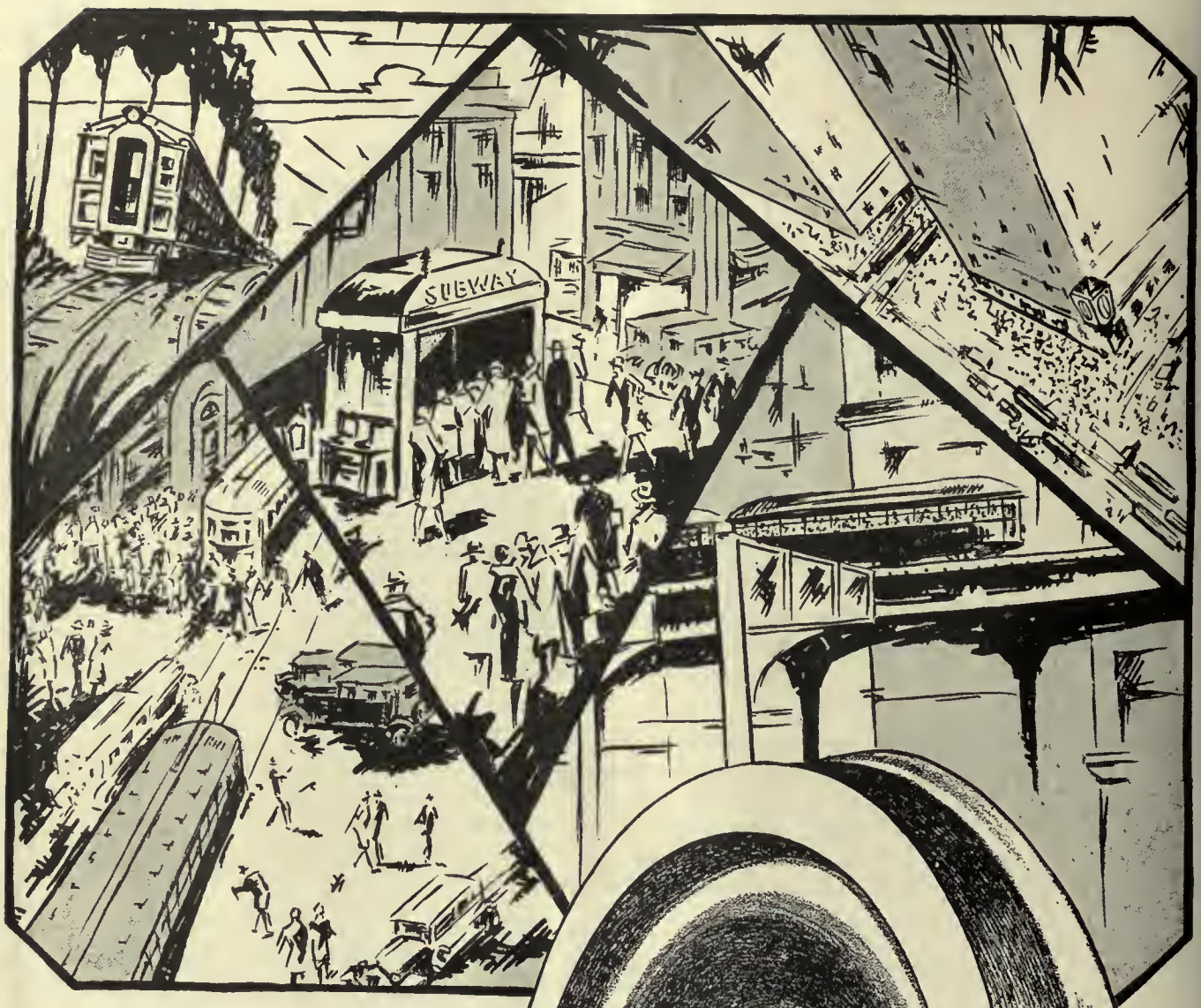
*Executive Office:* Graybar Building, New York

*General Works,* Rahway, New Jersey

CHICAGO
518 McCormick Building

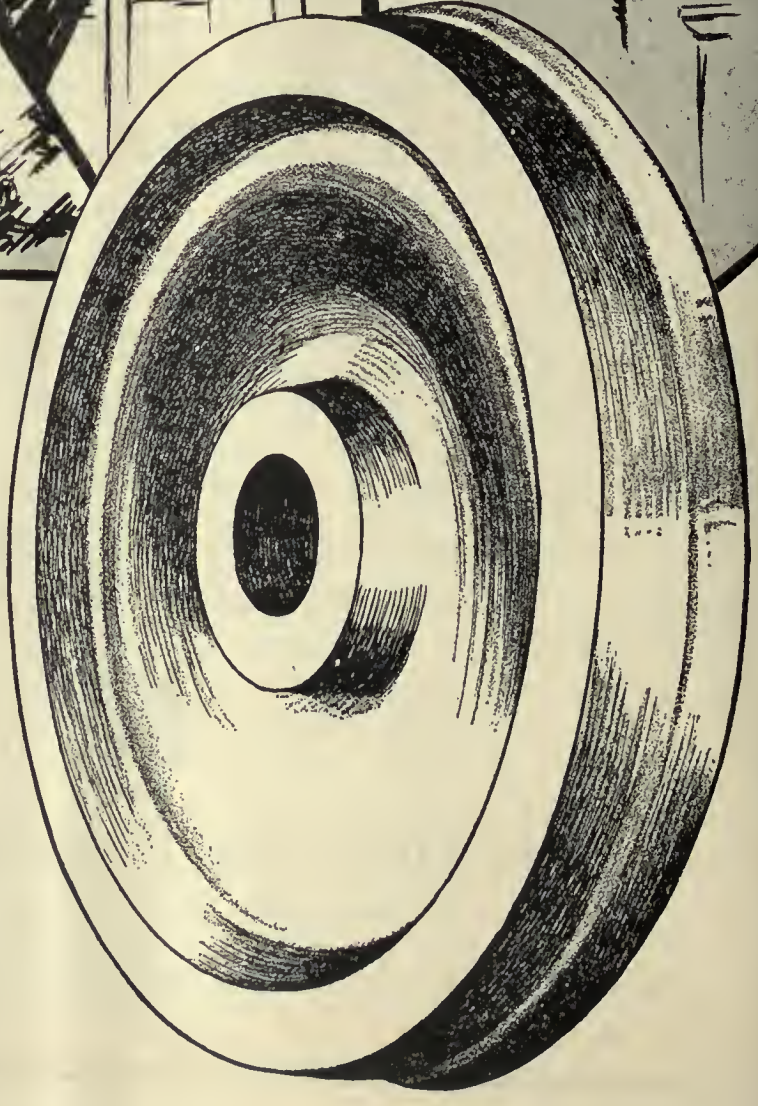
MANUFACTURED IN TORONTO, CANADA, BY
Railway & Power Engineering Corp., Ltd.

PHILADELPHIA
1010 Colonial Trust Building




From wheel blank to finished product, the Gary Wrought Steel Wheel is made by men who know the importance of the task that the electric railways perform each day, and the need for dependable equipment in performing it.

Carefully selected ore is converted into high grade steel. This, in turn, is converted by a process of rolling and forging into a wheel that can be depended upon to carry its load week after week and month after month with a minimum of attention. . . . . A carefully worked out inspection system is your assurance of a perfect product.



**Illinois Steel Company**
Subsidiary United States Steel Corporation
General Offices:
208 South La Salle Street
Chicago, Illinois

# Competition . . . NEVER Waits!



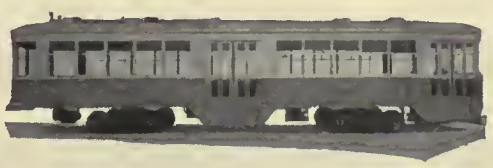
WRITE it down that competition will either benefit or destroy a business, but whichever it does, it never waits!

You need Cincinnati Modern Cars on your property today. Tomorrow the job of keeping your present patrons, winning back your lost ones, will be harder.

Your cars are your salesrooms, your customers are being impressed by the service you render today, not the service you may have been *planning* to render all these years.

Look to your cars—they're the foundation of your business.

Cincinnati cars will increase your business, create and *hold* more business—and they'll pay for themselves in a short time out of increased profits.



CINCINNATI CAR COMPANY
CINCINNATI, OHIO

## CINCINNATI BALANCED LIGHTWEIGHT CARS

# The Dayton Integra
# of Track and Paving

THE Dayton Integral System of Track and Paving Structure has been perfected through years of Engineering Research plus long experience with paved track.

Called forth by inherent weakness of wood tie, gravel ballast, with separate paving slab.

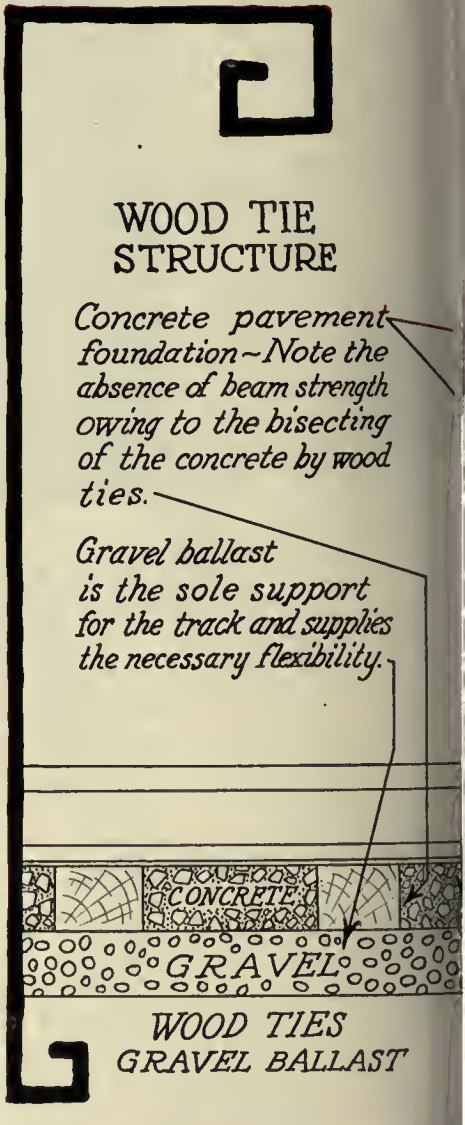
The Dayton Integral System unifies track and paving into a durable monolithic structure, in which complete strength of all parts is uniformly developed.

More than a tie, the Dayton Tie becomes in the Integral System a reinforcing member, plus an effective device for absorbing traffic vibration, which otherwise tends to destroy the concrete.

Both track and paving loads are carried by the whole thickness of the reinforced slab, much as concrete and reinforcing of a floor combine to carry a floor load.

Vibration absorption is accomplished by a mixture of asphalt and abestos fibre, contained in a metal box. Upon this mixture rests a wood block for the rail bearing.

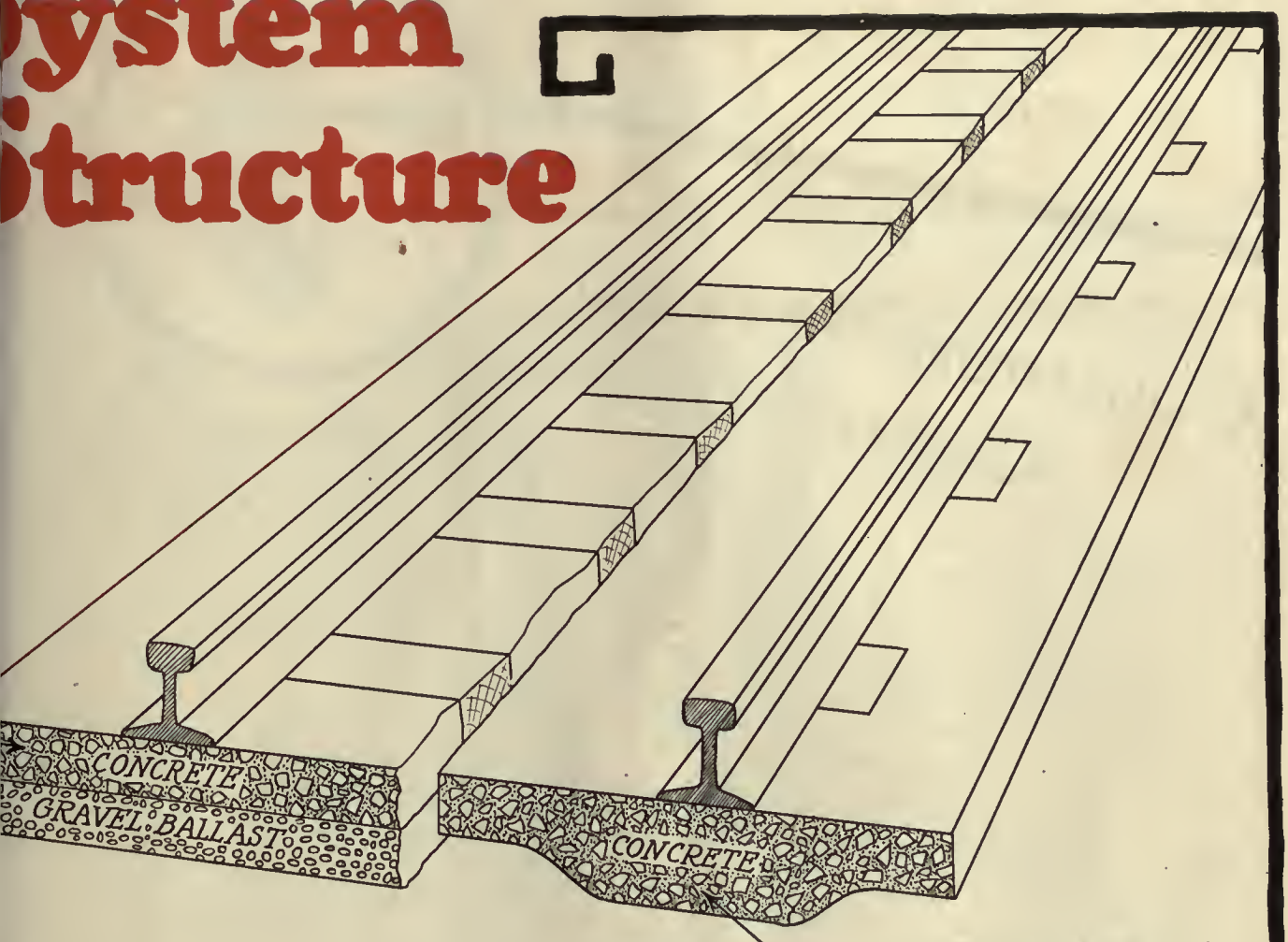
Many examples prove soundness. Notably Toledo, Ohio. Here it was necessary to wreck some eleven-year-old Dayton Integral Track (in perfect condition) to build an undergrade railway crossing. The Track was so solid that heavy pile drivers were resorted to after other demolition methods failed.






## Dayton Mechanical Tie

# ystem
# tructure

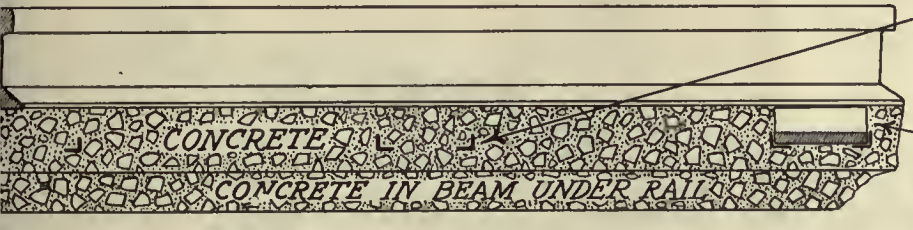



## DAYTON INTEGRAL STRUCTURE

*The concrete here serves as foundation for both pavement and track*

*The tie members reinforce the concrete beam, the whole thickness of which, both above and below the ties, contributes the strength.*

*The tie members, with their asphalt-asbestos cushion, give protection to the concrete from vibration and supply the flexibility*




DAYTON TIES IN CONCRETE

# ompany - Dayton, Ohio -



# Common—yet not Commonplace

The Safety Car Control Equipment . . . which interlocks power, brakes, and door control to provide maximum safety and convenience for cars operated by one man . . . is now universally used by traction properties.

To street railway men this equipment is familiar, yet not devoid of interest. It still attracts attention by virtue of its contribution to safe, speedy, and economical transportation. Its potentiality for improvement in service and public goodwill is being recognized more extensively from year to year.



**SAFETY CAR DEVICES CO.**
OF ST. LOUIS, MO.
*Postal and Telegraphic Address:*
**WILMERDING, PA.**
CHICAGO SAN FRANCISCO NEW YORK WASHINGTON PITTSBURGH

# Again!!

## America's Speed Trophy

*goes to the* NORTH SHORE LINE




It is worthy of note that the South Shore Line operating to South Bend was rated second.

We congratulate the winner, and are pleased that the performance of "Standard" wrought steel wheels and forged steel axles contributed to this success

**STANDARD STEEL WORKS COMPANY**

CHICAGO
NEW YORK
RICHMOND
PITTSBURGH

PHILADELPHIA, PA.
WORKS: BURNHAM, PA.

ST. LOUIS
HOUSTON
PORTLAND
SAN FRANCISCO

# Living up to the time-table

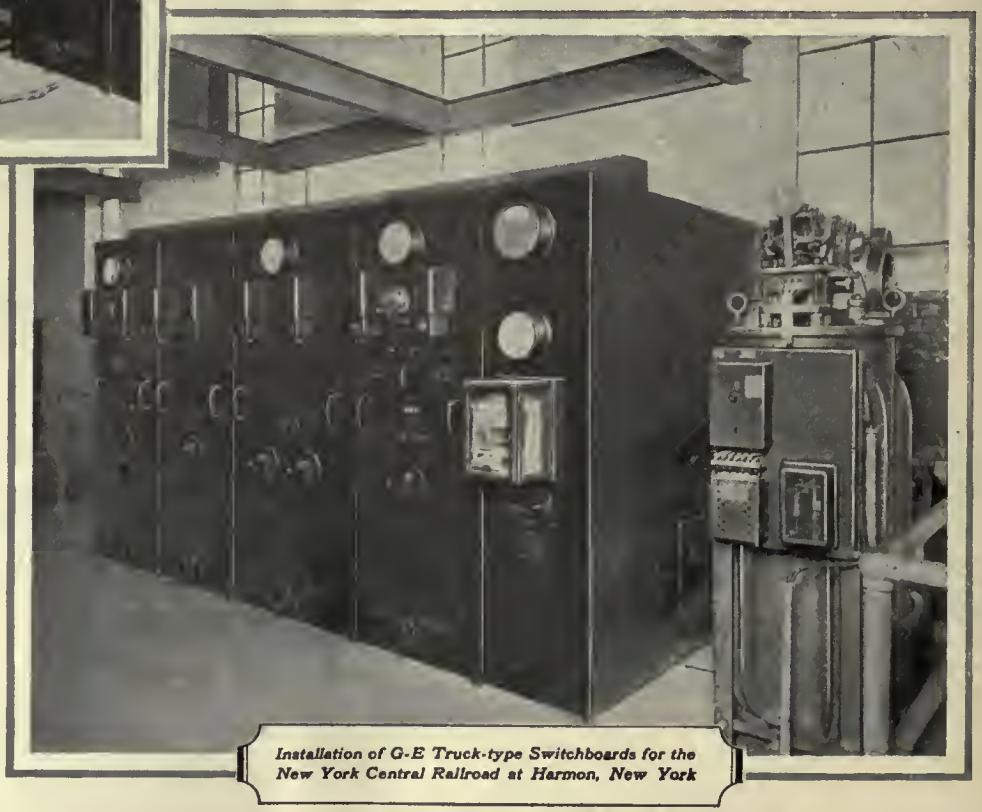




In the electrified zone of the New York Central Railroad, the mechanisms and apparatus which control traffic must not fail—trains must be on time.

General Electric truck-type switchboards, at Harmon and Port Morris, assist in maintaining continuity of service. Power and signal interruptions are minimized by the facility with which a spare truck can be inserted when it becomes necessary to withdraw a unit for inspection or repair. All live parts are enclosed and protected; this reduces fire hazard and practically prevents the danger of accident to personnel. Again, this type of switching equipment can be installed in the shortest possible time, for the units are completely assembled when shipped.

Consult any G-E switchgear specialist as to the application of G-E truck-type switchboards to your problem.



*Installation of G-E Truck-type Switchboards for the New York Central Railroad at Harmon, New York*

461-17

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

# Electric Railway Journal

*Consolidation of*
*Street Railway Journal and Electric Railway Review*

McGraw-Hill Publishing Company, Inc.
James H. McGraw, *Chairman of the Board*
Malcolm Muir, *President*
H. C. Parmelee, *Editorial Director*

CHARLES GORDON, *Editor*

Louis F. Stoll, *Publishing Director*

*Volume 72* New York, Saturday, December 29, 1928 *Number 26*

## "The Greatest Law Suit in History"

INTEREST on the part of the electric railways in the so-called O'Fallon case is not so remote as it at first might seem to be. The company's brief has been filed with the Supreme Court and the argument has been set for Jan. 2. The St. Louis & O'Fallon Railroad is resisting the efforts of the Interstate Commerce Commission to collect the recapturable portion of the alleged excess earnings of the carrier for the last ten months of 1920 and for the years 1921, 1922 and 1923. The amount which the commission is seeking to recapture in these proceedings is only $226,880 and interest. But the question of the principles of valuation seems involved, which is the reason for the attention attracted by the case.

The majority ruling of the Circuit Court held the commission's determination valid, with the specific reservation that the method used in arriving at the value on which the earnings in percentage are calculated should not enter into the case. The minority concurred in the judgement, but expressed the opinion that the commission's valuation method was justified, although defective in some particulars. It seems that the road earned more than 6 per cent on the full valuation claimed by it. The point the majority made was that under such circumstances a claim of confiscation could hardly be made. The brief of the company recently filed with the Supreme Court makes the point that in fixing the valuation of a railroad for recapture purposes under the transportation act, consideration should be given to all relevant facts and circumstances, including the present level of reproduction costs.

The O'Fallon case was the first decision by the Interstate Commerce Commission interpreting and applying the so-called recapture clause of the transportation act of 1920. Since no definite rule of valuation was laid down in that act, the commission proceeded on its own initiative. By a vote of six to four it held in effect that the value of the property for rate-making purposes, as determined by the commission for 1914, approaches more nearly the reasonable amount to be allowed on the property than the cost of reproduction. It based the valuation on its tentative valuation figures of 1919 (based on 1914 unit prices) as far as available, allowing for property added in succeeding years at actual cost less depreciation, without giving effect to the cost of reproducing the original property at present-day prices. The idea of cost of reproduction new at prices current on the valuation date, laid down as a rule in previous court decisions, was rejected by a majority of the commission on the ground that it would prevent stability of rates and that it was unjust and unworkable. Between that method and the use of 1914 unit prices as a base, the commission held no intermediate practice was "possible which is capable of being applied to any rule independent of the caprice of those who apply it."

Adoption of 1914 prices by the commission appears to be justified by that body on the theory that this schedule of prices is fair to all concerned. This question of a fair basis of valuation is obviously of major importance to every form of regulated utility. A member of the Interstate Commerce Commission is said to have referred to the case as "the greatest law suit in history." Should the Supreme Court by chance decline to pass upon the valuation and confiscation questions and affirm the previous ruling, the railroads would be back where they started on the valuation issue. Not only that, but utilities in general would be deprived of the benefits of a ruling that would tend further to clarify the much contested question of proper valuation. The fact that no utility other than a railroad is affected by the "recapture" statute does not lessen the general interest in the case, provided, of course, the Supreme Court in its decision does deal with the matter of the basis of the valuation.

## There Is Danger in the Lure of New Business

IN ONE of his well-known fables, Æsop tells how a dog, carrying a piece of meat in his mouth, saw in the water of a stream he was crossing, what appeared to be another dog also carrying a piece of meat. Opening his mouth to snap at the reflection in the water, and dropping his own piece of meat, he realized his folly too late.

In the transportation industry, new forms of business appear extremely alluring. This is particularly true of new bus business. Chartered trips, special tours, de luxe operation at higher fares, and similar types of service offer an attractive means of augmenting transportation revenue. The harassed manager, weary of trying to render adequate mass transportation service for an inadequate fare, turns with enthusiasm to this new field where there seems to be a chance to make a reasonable profit. This is as it should be. The attractive opportunity which he envisages is far more substantial than the shadow seen by Aesop's dog. It is well worth going after—but it should not divert attention from the all-important task of holding fast to existing business by improvements carried out with enthusiasm comparable to that manifested in developing a new field of operation.

The straphanger in a crowded, dirty, old-fashioned street car is not particularly interested in the fact that the same company operates attractive de luxe bus service on some other route. What he wants is good service on his own route. That the company operates special bus service is no reason that it should not also render good mass transportation service, but it sometimes happens that enthusiasm for the former results in neglect of the latter. The outcome of such a policy cannot be other than disastrous. Special service holds much promise as a supplement to regular service. In the long run, however, the company's fate will be determined by the quality of its regular service, which is the backbone of the community transportation system.

## Ten Years of Service at Cost in Rochester

NEGOTIATIONS seem likely to begin soon for a renewal of the service-at-cost contract under which the Rochester Lines of the New York State Railways are operated. The present contract, drawn for a period of ten years, remains in effect until Aug. 1, 1929. That the contract will be renewed seems quite likely. It also seems quite likely that the contract will be modified. There have been some differences of opinion about the valuation figure, but while the railway officials believe that a higher valuation is justified, they are understood to be willing to allow the present figure, $20,314,905, to stand.

The situation in Rochester has been changed recently by the operation of the high-speed line built in the old canal bed. Some modification in the contract may be necessary because of this operation, although other changes that may be made are a matter of speculation at this time. But in the light of the coming negotiations the figures on operation in Rochester for the year ended July 31, 1928, digested in the JOURNAL for Dec. 15, are of special interest. To recapitulate them is not necessary. It is of interest, however, to note that riding continues to decrease. This decrease in passengers over the previous year was 5,180,000, or 7.7 per cent. For the year there was a surplus from trolley operation of $67,898, but this was offset by a deficit of $60,105 on the bus lines and a deficit of $8,123 from subway operation, making the total deficit for the year $329, compared with a deficit of $60,128 for 1927. The accumulated deficit for the period of the service-at-cost contract as of July 31, 1928, was $341,791.

Full account of the fact that some of the bus lines have been extended into territory that cannot for the present be expected to afford a return is taken by the commissioner of railways of the city in his report. He is apparently opposed to economies that would impair the character of the service, for he says that there is only reasonable fulfillment of the requirements for comfort and convenience of passengers. There is no disposition to suggest further economies at the expense of the patrons' comfort. In other words, Rochester wants service and is prepared to pay for it. If that were not so then the fact would have been manifested following the recent announcement by the company that on Jan. 1 cash fares will go to 10 cents. The ticket rate will, however, remain at twelve for a dollar.

While Rochester appears to be willing to pay, there is no disposition to be profligate. Out of the fourteen lines operated in the city only two are handled with one-man cars, with some additional use of this type of equipment on other lines on Sundays and during hours of light travel. Mr. Barnes, the commissioner, holds that the serious reduction in the number of passengers carried by the trolley cars in the service-at-cost territory requires that, if possible, some steps be taken to change this condition. He feels that this can best be done, as demonstrated by the experience of other cities, by extending the use of one-man cars to other lines and reducing the headway on these lines during the non-rush hours, thus improving the service while at the same time reducing the cost.

On the whole, it is a broad view of the matter to which Rochester apparently subscribes, particularly since the railway commissioner has reiterated the fact that co-ordination of transportation in the manner now existing in Rochester is becoming increasingly necessary and favored throughout the country. The service-at-cost type of franchise was adopted originally in Cleveland as a way out of a very complicated situation. The grant there had to be modified in the light of subsequent experience. That also was true in Toledo. It may prove true in Rochester. It does appear, however, that Rochester is in a position to profit immeasurably from its own experience and the experience of others. Regardless of the details of the new contract, so long as it adheres to the principles of co-ordination and adequacy of service above other considerations Rochester will not go far wrong.

## Ideals Flow Through Channels of Human Contact

TWO questions immediately confront the management which plans to keep its employees informed on company affairs so that they may be properly equipped to capitalize the opportunities offered by their contacts with the public. First, what information should be given to the employee, and second, what methods should be employed in transmitting this information to the rank and file of the operating organization? Actual practice today varies widely with differences in policy and attitude on the part of railway managements.

In general, however, it is almost self evident that employees should have a working knowledge of the general economic problems that confront an electric railway, with particular attention to the principal factors that are controlled by the public's attitude toward its railway. In addition, employees should be furnished with specific information concerning the activities of the company. If the platform man realizes the effects of the radio, the private automobile, the taxicab and other forces of competition, he will recognize the need for meeting this competition and will be able to talk intelligently about his company's affairs to those of the public who inquire.

Periodic statements of revenue and operating expenses should be distributed among the employees. There is no surer way of making them feel that they are being given all of the essential facts regarding their company's operations.

On comparatively small systems the problem of disseminating information among the employees is not a difficult one. On the larger systems, however, this task becomes more difficult and complicated. Educational classes, interestingly and intelligently conducted, offer an effective method. These can be supplemented to advantage by bulletins, house organs and other publications. Nothing, however, can take the place of regular, direct contact by responsible officials with the men in the ranks. Unfortunately, it is physically impossible on a large system for the chief operating executive himself to talk directly to all of his men except in large meetings which necessarily take on an element of formality.

Day to day contacts must necessarily be maintained through authorized representatives. To the degree that these supervisory officials down the line reflect the true ideals and objectives of the management, they will be successful in developing that spirit of teamwork which is so essential in the transportation business today. It is upon these channels of human contact within an organization, that management today is chiefly dependent for transmitting not alone the facts of the company's operation, but its ideals as well, to the men in actual contact with the public.

## Alert Management Succeeding Even in Small Communities

ARTICLES and advertisements now inform a sophisticated public that in the United States there are some 3,000,000 "two-car" families. It is safe to assume that a large proportion of these families are located in the smaller cities where backyards are big and parking space downtown is liberal. Yet even in these towns there is ample evidence that public transportation facilities are a necessity.

A case in point is that of the Greenfield & Montague Transportation Area, the progress of which is discussed elsewhere in this issue. Originally this was part of a far-flung cross-country trolley system which had none too many riders even in the pre-automobile era. The automobile took away most of the country business and threw the property into bankruptcy. Under Massachusetts' transportation area act, one fragment of the property was purchased for a little more than scrap value by Greenfield with 16,000 inhabitants and its neighbor, Turner's Falls in Montague Township, with 5,000 inhabitants. There are plenty of automobiles in both places, but the citizens declared by formal ballot that they wanted dependable public transportation too.

One might expect that a system like this would be handled in a humdrum way, for who would really try to make transportation pay in communities of such size when the law permits the bond interest and amortization to be a lien on the general tax funds? Yet the contrary has been the case. The manager believed that you can get more riders on smooth track than on bumpy track; more riders on soft cross-seats than on hard longitudinal benches; more riders with cheery-colored cars than with funereal shades; and more riders with frequent, sensibly-worded appeals for patronage than with glum advertisements about getting a square deal.

The manager not only believed these things himself, but also sold his viewpoint to his trustees and the public. The result was surprising. The Greenfield & Montague Transportation Area today is doing far better than could reasonably have been expected. It may not be making a return on "reproduction cost new." However, if judged from the commercial basis of a merchant who makes a fresh start with a marked-down inventory of his out-of-date stock, this undertaking shows every promise of being rebuilt into a successful business.

## Brooklyn Bus Settlement in Sight

PROSPECTS appear to be promising for a new alignment of surface lines in Brooklyn, with bus service co-ordinated. So far as the public announcement indicates, the plan would contemplate the segregation of the surface lines of the Brooklyn-Manhattan Transit Corporation from the rapid transit lines and the operation of these surface lines in conjunction with 82 miles of bus routes of the Equitable Coach Company in Brooklyn and Queens, for which rights have been granted by the city but still subject to approval of the New York Transit Commission as to their convenience and necessity.

It is a matter of speculation whether the lines of the Brooklyn City Railroad will be included, but it would appear more than likely that they will. In any event the territory will undoubtedly be so allocated that there will be no duplication of service. This would leave to the Equitable the franchise rights it has obtained for crosstown lines in the Borough of Manhattan.

The possible modification of the rights of the Equitable is a subject now before Mayor Walker. Pending the result of negotiations with the city by the interests concerned in this latest move, the New York Transit Commission announced that it would suspend all proceedings on the Equitable's plea for certificates of convenience and necessity. The matter of bus rights in New York City has been long drawn out. So far as the borough of the Bronx is concerned the principal bus awards there were made to a subsidiary of the Third Avenue Railway and a service of more than 75 miles of routes is being run in that borough. Now it begins to look probable that the issue in Manhattan, Brooklyn and Queens will be settled on the basis of co-ordination instead of needless competition and duplication. On that basis it could have been settled long ago.

## Regulation Essential for Taxicab Stability

RECENT figures quoted in the public press indicate the importance of the taxicab in the field of urban transportation and the need for stabilization of this preferred carrier system by regulation. A. Freed, president of the Paramount Cab Manufacturing Company, estimates that the 20,000 cabs in New York City have an annual income of $160,000,000. He says that for every $1 received by all other public transportation agencies in New York, $1.02 is spent for taxi rides.

Nevertheless, the mortality rate in the taxi business is high. It is reasonable to believe that lack of regulation and independent operation of cabs, resulting in price wars, inferior service to the public, and traffic congestion, are largely responsible for the unsavory record of this business. When cabs are operated in large fleets by organizations properly controlled, each cab is in use from 18 to 24 hours a day, requiring from two to three drivers. Repairs and service are made in the most economical way by mass production methods. Thus major economies in equipment and in maintenance are made possible, to say nothing of the reduction in waste mileage and street congestion that results from an organized and responsible service.

Such operation by individual owners is impossible. As a result, the taxi industry contains a large percentage of owner-drivers who work from twelve to fourteen hours a day, often converting their cabs to semi-jitneys, in an attempt to keep their individual taxi businesses in existence. If such a labor condition existed in any of the so-called capital controlled industries, regulatory legal steps would be taken immediately.

The public should have primary consideration in the operation of any means of public transportation. For this reason public utilities are subjected to regulation. The important place to which the taxicab has grown in the transportation of the general public is indicated by the income figures cited for New York. It is an important utility and, when unregulated, degenerates through unrestricted competition both within itself and with other transportation organizations which are under public control. Why then should not taxicabs be under supervision comparable to that exercised over other utilities? Regulation would benefit the cab industry through stabilization. It would lead to co-ordination in operation that would reduce traffic congestion. It would surely tend to make it possible for each cab to earn its justified income, give better service and bring working conditions for cab drivers to a par with that of other industries.



Cars of the Greenfield & Montague Transportation Area operate over this bridge across the Connecticut River

# Continued Improvement

## Shown at Greenfield

**Rehabilitation, new de luxe cars and merchandising methods have brought a substantial increase in the net earnings of the operating company**

CONCLUSIVE evidence of the need for public transportation systems in small communities is furnished by the experience of the Greenfield & Montague Transportation Area during the past four years. Located in the middle valley of the Connecticut River, these Massachusetts towns are in rather hilly country, which gave them a relatively high riding habit in the old days. Conditions are different now because the skilled mechanics who make up most of the wage-earners have long been owners and operators of automobiles. The only way for the electric railway to appeal to them is with modern service at attractive fares. That this has been done successfully is shown by the fact that the railway revenue for the past two years has averaged more than 10 per cent above the figures that were reached in 1925.

This undertaking dates from the transportation area act of 1920. Under this act, one or more communities may unite to establish a "transportation area" under that specific title, when the property can be bought "on the basis of actual value at the time of appraisal and not on the cost of replacement."

### Origin of the Transportation Area

Following the mandate of a general election on May 24, 1924, the two towns of Greenfield and Turner's Falls in the township of Montague, paid the receiver of the Connecticut Valley Street Railway $62,000 for 8.7 miles of track with cars and repair facilities. Operation began on Aug. 1, 1924, under a board of four trustees, two from each town, who appointed Frederick A. Persons to be superintendent-manager. Although publicly owned, the Transportation Area is subject to the regulation of the State Department of Public Utilities with regard to fares, extensions, expenditures for new cars and so forth. The funds for the original purchase came through an

issue of ten-year serial bonds, of which $70,000 were issued by Greenfield and $31,000 by Montague. Since the purchase price was $62,000, the undertaking began with a working capital of $39,000.

The transportation area act permits deficits to be made up out of taxes. Luckily, it has not been necessary to take advantage of this provision. Depreciation is figured on the basis of not less than 3 per cent and not more than 5 per cent of the book value. The higher figure is used in this instance because of the low investment.

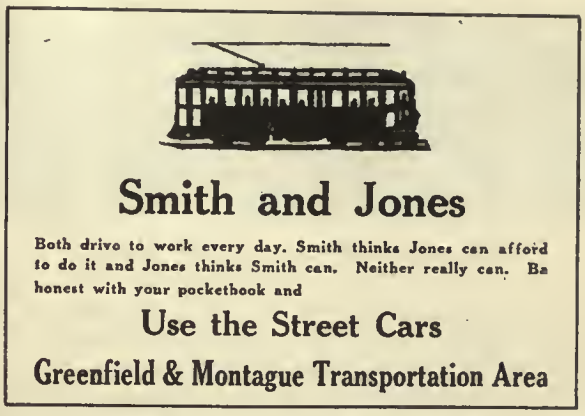
### Alternative Bus Operation Abolished

The period of the World War, 1914-1918, was one of tremendous activity in the Greenfield-Turner's Falls district because of the demand for precision tools, shell-making machinery and other war supplies. As elsewhere, these conditions were accompanied by an influx of jitneys. It was not until 1918 that Massachusetts passed legislation permitting electric railways to run buses; and it was 1919 before the Connecticut Valley Street Railway was running them between Greenfield and Turner's Falls, a distance of 3.14 miles by highway but 4.8 miles by railway. These buses were operated on the basis of cutting the railway service in two, giving a combined headway of 30 minutes. The same fare was charged on the buses as on the cars.

When the Transportation Area took over the property its management could not see the utility of running two classes of service. It was concluded that all-rail service on the 30-minute headway was the most economical and the one that would get most out of the investment. The question of greater safety on grades in winter-time was also a factor in the decision to stick exclusively to the rail.

### Track and Car Rehabilitation Begun at Once

The property taken over was not far from the status of junk. Extensive rehabilitation was necessary. For example, a total of 9,192 ties have been replaced. On the basis of 2-ft. spacing, this corresponds to 3½ miles of the 8½ miles operated. The bridge over the Connecticut River has been completely repaired, repainted and its timber deck and rails completely replaced. Hundreds of dished joints were welded and ground smooth; much special work replaced; the overhead wiring repaired; and a new roof put on the carhouse. Moreover, all of the rolling stock was painted an attractive combination of chrome yellow and cream. Two of the six-passenger cars were fitted with automobile cushion cross seats in place of side seats.




Type of newspaper advertisement used to sell electric railway transportation in Greenfield

The rehabilitation carried out during the fall of 1924 and the season of 1925 was charged in part to capital account and in part to maintenance of way. The work done during 1926 and 1927 was charged entirely to maintenance account. In all, about $30,000 was expended on rehabilitation up to the end of 1927, over and above ordinary maintenance charges.

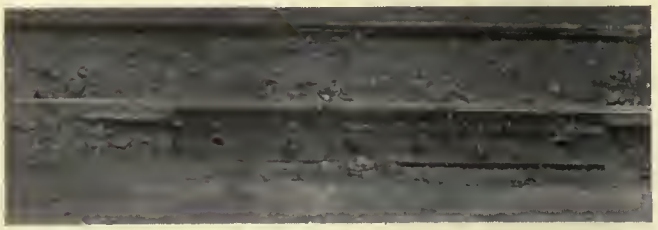
Nor was rehabilitation all that the management undertook. Encouraged by a 25 per cent increase in receipts which followed double-truck car operation on Conway Street, Greenfield, in March, 1926, specifications were prepared for two light-weight, semi-steel cars with deep-cushioned, leather-upholstered seats. These cars were delivered in May, 1927.

### Ride-Selling Campaign Begun

By Dec. 1, 1925, physical improvement of the property had reached the point where the management felt that ride-selling ideas could be applied. Up to that time there had been no regular newspaper advertising nor changes in fare. The standard rates had remained 10



Corner of Federal and Main Streets, Greenfield, the heart of the transportation system



Appearance of rail joint after repairs

cents cash minimum and twelve tokens for 50 cents, but as two tokens were charged for the first two zones or part thereof, the lowest adult rate was 8⅓ cents. Beginning Nov. 30, 1925, two types of unlimited-ride, transferable weekly passes were offered: a $1 pass good in any selected pair of adjacent zones; and a $1.50 pass good within the entire five zones. The pass proved successful despite the fact that most of the buyers could not take advantage of the luncheon period to eat at home; nor could the property offer the short headways and variety of off-peak attractions of larger cities. Nevertheless the first twelve months of 1926 showed a revenue improvement from $79,024 to $86,938, or 10 per cent, as compared with the preceding year.

A Sunday-holiday pass was started on May 1, 1927, and has been retained as an all-year feature. Another new-business idea was the trial of evening passes for the summer, beginning with June 26, 1927. These daily passes and evening passes cost 25 cents as compared with 50 cents a round trip with cash or 43⅓ cents with tokens. Holders of the $1 weekly passes may ride into additional zones on payment of 5 cents cash or a 4⅙-cent token per zone.

### Special Causes Bring Temporary Recession of Earnings

Every move that the Transportation Area has made in modernizing the equipment and sales methods of the property indicates that there is a demand for service, regardless of the large use of the private automobile. This was shown in the growth of revenue and riding during 1926 in comparison with 1925, when passenger revenue advanced 10 per cent, and the increase in the number of riders was about 26 per cent!

For the first ten months of 1927, a further improvement was noticed. Then came the great flood of November, 1927, which cost something like $2,500 in receipts, and extra expense in restoring the condition of the property. Nevertheless, with a drop of $1,270 in revenue, total operating expenses were lowered by $4,592. This saving made it possible to apply $5,000 to reserves under "appropriations of surplus" as against $1,600 in 1927 and $1,450 in 1926.

BALANCE SHEET,
GREENFIELD & MONTAGUE TRANSPORTATION AREA

ASSETS

| | 8/1/24 | 12/31/24 | 12/31/25 | 12/31/26 | 12/31/27 |
|---|---|---|---|---|---|
| Cost of roadway | $22,500 | $22,298 | $38,944 | $38,944 | $38,944 |
| Cost of equipment: | | | | | |
| Cars and electrical equipment | 17,000 | 17,300 | 17,300 | 18,789 | 46,034 |
| Miscellaneous tools | ..... | 1,783 | 3,606 | 3,760 | 3,988 |
| Furniture | ..... | 524 | 389 | 389 | 389 |
| Cost of land and buildings | 22,500 | 23,151 | 24,918 | 24,918 | 24,918 |
| Total investments | $62,000 | $65,058 | $85,159 | $86,801 | $114,275 |
| Cash | 38,977 | 24,153 | 16,173 | 23,159 | 11,478 |
| Miscellaneous accounts receivable | ..... | 978 | 1,460 | 537 | 571 |
| Material and supplies | ..... | 6,318 | 8,872 | 8,790 | 10,030 |
| Interest, dividends, rents received | ..... | 112 | 245 | 295 | 177 |
| Total current assets | $38,977 | $31,562 | $26,752 | $32,782 | $22,257 |
| Prepaid insurance and taxes | ..... | 1,288 | 1,124 | 1,303 | 3,174 |
| Other unadjusted debts | ..... | 9,885 | 226 | 94 | ..... |
| Total unadjusted debts | ..... | $11,173 | $1,351 | $1,398 | $3,174 |
| Grand total | $100,977 | $107,794 | $113,262 | $120,982 | $139,707 |

LIABILITIES

| | | | | | |
|---|---|---|---|---|---|
| Town of Greenfield | $69,977 | $69,977 | $69,977 | $69,977 | $69,977 |
| Town of Montague | 31,000 | 31,000 | 31,000 | 31,000 | 31,000 |
| Total capital | $100,977 | $100,977 | $100,977 | $100,977 | $100,977 |
| Loans and notes payable | ..... | ..... | ..... | ..... | 6,700 |
| Accounts and wages payable | ..... | 2,529 | 2,407 | 3,384 | 2,691 |
| Accrued interest, dividends | ..... | 963 | 294 | 398 | 252 |
| Total current liabilities | ..... | $3,493 | $2,702 | $3,782 | $11,644 |
| Operating reserves | ..... | 800 | 699 | 1,399 | 2,099 |
| Accrued depreciation—road and equipment | ..... | 1,303 | 4,609 | 9,215 | 14,139 |
| Other unadjusted credits—tokens | ..... | 550 | 1,652 | 1,315 | 1,509 |
| Total unadjusted credits | ..... | $2,654 | $6,961 | $11,930 | $17,748 |
| Miscellaneous fund reserves | ..... | 500 | 2,400 | 4,000 | 9,000 |
| Profit and Loss | ..... | 170 | 221 | 292 | 336 |
| Total corporate surplus | ..... | $670 | $2,621 | $4,292 | $9,336 |
| Grand total | $100,977 | $107,794 | $113,262 | $120,982 | $139,707 |

As occurred on many other New England properties, the first quarter of 1928 fell behind because of an unusually mild winter. Another loss was suffered from a change in the movement of Boston & Maine train crews. These crews formerly were good cash customers on the run between East Deerfield yards and Greenfield, but since April 1 most of the train crews run through between Boston and Troy and Mechanicsville, N. Y.

Despite these difficulties, the management is facing the future with confidence. Indications point to better industrial conditions, which will benefit the railway. Since April, 1928, the sale of weekly passes has increased 5 per cent over the same period of 1927. Pass sales, it is believed, are a good index of the trend of employment.

The accompanying tables tell the story clearly.

It should be noted that the division of the route into zones calls for multiple registration of the same rider. While there were 2,281,056 fare registrations for 1927, there were two registrations for each 10-cent cash fare, 8⅓-cent token fare or $1 pass; and three registrations for each 15-cent fare, 12½-cent token fare or $1.50 pass. The actual number of individuals, based on an average of 2.25 registrations per rider, would thus be 1,013,802 or 4.43 per car-mile.



Electric arc welder and electric rail grinder were used in track reconstruction

COMPARATIVE INCOME STATEMENTS

| | 1924* | 1925 | 1926 | 1927 |
|---|---|---|---|---|
| Passenger revenue | | | | |
| Cash fares | $22,204 | $51,404 | $50,824 | $48,519 |
| Token fares | 7,956 | 23,407 | 12,766 | 12,268 |
| School tickets | 919 | 2,588 | 2,736 | 2,285 |
| Weekly passes | ..... | 1,623 | 20,611 | 22,209 |
| Sunday and holiday passes | ..... | ..... | ..... | 515 |
| | $31,080 | $79,024 | $86,938 | $85,797 |
| Special car revenue | ..... | ..... | 143 | 21 |
| Mail revenue | 176 | 432 | 422 | 422 |
| Express revenue | 57 | 152 | 412 | 505 |
| Total revenue from transportation | $31,314 | $79,608 | $87,916 | $86,746 |
| Station and car privileges | 133 | 319 | 319 | 319 |
| Rent of buildings and equipment | ..... | 9 | 18 | 55 |
| Miscellaneous | 48 | 539 | 90 | 127 |
| Total revenue from other railway operations | $182 | $868 | $428 | $502 |
| Total railway operating revenue | $31,496 | $80,477 | $88,345 | $87,249 |
| Maintenance of way | $4,009 | $17,342 | $22,621 | $16,634 |
| Maintenance of electric lines | 450 | 1,898 | 886 | 1,889 |
| Buildings, fixtures and gooda | 28 | 146 | 168 | 564 |
| Depreciation of way and structures | 945 | 2,341 | 706 | 703 |
| Total way and structures | $5,433 | $21,728 | $24,383 | $19,792 |
| Maintenance of cars | 2,518 | 6,486 | 6,175 | 4,803 |
| Maintenance of electrical equipment | 1,542 | 3,818 | 4,746 | 4,162 |
| Miscellaneous equipment expenses | 74 | 118 | 154 | 47 |
| Depreciation of equipment | 357 | 964 | 3,552 | 4,575 |
| Total equipment | $4,492 | $11,388 | $14,628 | $13,589 |
| Total power—purchased | 6,892 | 17,481 | 18,307 | 17,899 |
| Car operators | 6,358 | 15,123 | 15,297 | 15,418 |
| Miscellaneous transportation expenses | 1,641 | 3,890 | 4,214 | 4,489 |
| Total conducting transportation | $8,000 | $19,013 | $19,512 | $19,907 |
| Total traffic expenses | ..... | 275 | 336 | 531 |
| General expenses | $2,680 | $6,423 | $6,500 | $6,877 |
| Injuries and damages | 828 | 123 | 140 | 591 |
| Insurance | 843 | 1,999 | 2,019 | 1,971 |
| Stationery and printing | 165 | 358 | 445 | 467 |
| Stores expenses and rents | 33 | 40 | ..... | 53 |
| Total general and miscellaneous | $4,552 | $8,946 | $9,106 | $9,960 |
| Total railway operating expenses | 29,371 | 78,833 | 86,274 | 81,681 |
| Net operating revenue | $2,124 | $1,643 | $2,070 | $5,567 |
| Taxes | 555 | 642 | 597 | 575 |
| Operating income | $1,569 | $1,001 | $1,473 | $4,992 |
| Income interest | 270 | 794 | 595 | 799 |
| Gross income | $1,839 | $1,796 | $2,068 | $5,791 |
| Interest unfunded debt | 206 | ..... | ..... | 493 |
| Net income | $1,633 | $1,796 | $2,068 | $5,297 |
| Appropriations of surplus | | | | 1 |
| Reserves | 500 | 1,450 | 1,600 | 5,000 |
| Dividends | 963 | 294 | 398 | 252 |
| Total appropriations | $1,463 | $1,744 | $1,998 | $5,252 |
| Net surplus to "profit and loss" | $170 | $51 | $70 | $44 |

*1924—5 months of operation.

The decrease in way expenses shows that the ideal of a smooth rail is approaching fulfillment; and the decline from 3.7 kw.-hr. to 3.5 kw.-hr. per car-mile with only a half-year's use of lighter cars for part of the mileage demonstrates one of the outstanding advantages of modern equipment.

OPERATING STATISTICS

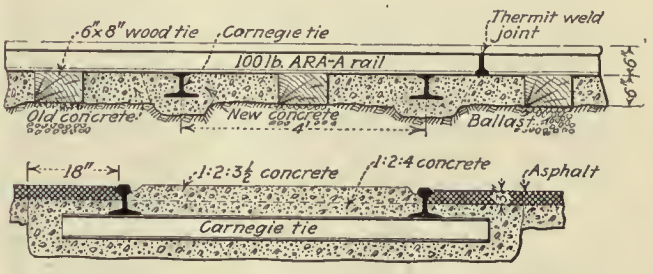
| | 1924* | 1925 | 1926 | 1927 |
|---|---|---|---|---|
| Cash fare registrations | 444,085 | 1,028,092 | 1,016,484 | 970,393 |
| Token fare registrations | 190,962 | 561,782 | 306,400 | 294,435 |
| School ticket registrations | 36,770 | 103,573 | 109,443 | 91,426 |
| Weekly and Sunday pass registrations | ..... | 61,292 | 810,117 | 903,756 |
| Transfers | 16,386 | 45,999 | 26,643 | 21,046 |
| Total registrations | 688,203 | 1,800,738 | 2,269,087 | 2,281,056 |
| Passenger car-miles | 94,307 | 225,800 | 229,663 | 228,579 |
| Passenger car-hours | 11,319 | 26,983 | 27,373 | 27,476 |
| Operating revenue per car-mile | $0.33397 | $0.35641 | $0.38467 | $0.38170 |
| Operating expenses per car-mile | .31144 | .34913 | .37565 | .35734 |
| Operating revenue per car-hour | $2.78258 | $2.98252 | $3.22746 | $3.17547 |
| Operating expenses per car-hour | 2.59490 | 2.92161 | 3.15180 | 2.97283 |
| Alternating-current kilowatt-hours purchased | 361,550 | 947,760 | 1,022,860 | 985,800 |
| Direct-current kilowatt-hours converted | 300,990 | 768,400 | 842,040 | 793,174 |
| Average efficiency-substation, per cent. | 83.25 | 81.09 | 82.32 | 80.45 |
| Average cost per alternating-current kilowatt-hour | $0.01906 | $0.01844 | $0.01789 | $0.01815 |
| Ties used | 1,610 | 3,244 | 2,547 | 1,791 |
| Average cost | $0.966 | $0.866 | $0.611 | $0.806 |

*1924—Only 5 months of operation.

# Track Reconstructed Using Both Steel and Wood Ties

By A. W. Baumgarten
*Division Engineer Chicago & Joliet Electric Railway, Joliet, Ill.*

During the summer of 1928, the Chicago & Joliet Electric Railway was confronted with the problem of rebuilding 3,300 ft. of single track. The 60-lb., 6-in. rail was completely worn out and the condition of the paving also was bad. The old standard single-track construction consisted of wood ties on stone ballast, concrete paving base from the bottom of the wood ties to the base of the rail, and grouted brick paving on a sand cushion. Upon examining sections of such track that had been in use for over ten years, it was found that a slight settling of the rail structure had occurred on account of the settling of the stone ballast, thereby causing paving failures in areas where automotive traffic was fairly heavy. From previous experience on double-track construction, it was believed that steel ties in concrete would be a more permanent type of structure.




**Cross-section of the type of combined wood and steel tie construction used in relaying 3,300 ft. of track in Joliet, Ill.**

However, on single-track lines, this type of construction could not be used without interrupting service unless temporary track was laid. Laying temporary track would have made the cost of the work almost prohibitive. It was decided, therefore, to design a combination of wood tie, steel tie and concrete structure which would permit the work to be done without excessive cost, while still obtaining to a large extent the advantages of the steel tie in concrete. A plan and cross-section of this design is shown herewith. The materials used consisted of 100-lb., A.R.A. type "A" rail with Carnegie type M-26 ties and 6-in. x 8-in. x 7-ft. wood ties spaced alternately on 2-ft. centers.

The procedure of removing the old structure and relaying track and paving was carried on with minimum interruption to service. All of the old brick paving was removed down to the base of the rail at the same time the old concrete was broken away from each side of the alternate wood ties. It so happened on this particular construction that the concrete paving base was in excellent condition and the old wood ties were in fair condition with the exception of being rail-cut. For this reason, it was decided to remove only alternate wood ties to be supplanted by Carnegie steel ties, leaving the old concrete paving base and remaining wood ties on which to surface and line the new 100-lb. rail. Short sections of the old rail were then removed; at the same time old wood ties which had been previously loosened were taken out, new steel ties placed in the old trench and new rail laid in place. In this way, practically no interruptions occurred in service over this track.



**New track as it looked before flange-way forms were removed or outside strips filled with asphalt**

The new rail was next surfaced and lined on the old wood ties, using steel and wood shims where necessary, the steel ties also being connected to the rail. After installing several hundred feet of rail section as outlined above, the new rail joints were thermit-welded and ground to surface, leaving the section of track ready for concreting. Concrete was poured monolithic to the surface between rails, using a 1:2:4 mix with a low water content on the base and a 1:2:3½ mix on the top, three inches of paving surface between rails. Because this track was laid in a street with asphalt paving, it was decided not to lay a concrete surface over the 18-in. space outside the rail. Concrete was laid in the 18-in. space only to within three inches of the top of the rail, this strip later being filled with asphalt and thoroughly rolled.

Flange-ways were formed by wiring wood strips to the rails, allowing them to remain in place for about four hours until the concrete had started to set. In finishing the top surface of the paving between the rails, the concrete was thoroughly tamped with a tamping bar but no belting was done, leaving the surface somewhat roughened.

CONSTRUCTION COST OF 3,300-FEET CONCRETE PAVED TRACK

| Material | Total Cost | Cost per Foot |
|---|---|---|
| Rails—100 lb. ARA | $5,255.00 | $1.59 |
| Ties—steel | 2,205.00 | .67 |
| Cement | 2,193.23 | .66 |
| Sand and gravel | 1,590.74 | .48 |
| Joints—thermit-welded | 552.00 | .17 |
| Asphalt paving | 2,782.50 | .84 |
| Miscellaneous material | 1,062.14 | .32 |
| Engineering superintendence, accounting, etc. | 2,817.92 | .86 |
| Total material | $18,458.53 | $5.59 |
| Total labor | 6,208.34 | 1.88 |
| Total cost of new track | $24,666.87 | $7.47 |
| Labor removing old track and paving | 2,337.00 | .71 |
| Total cost of completed job | $27,003.87 | $8.18 |

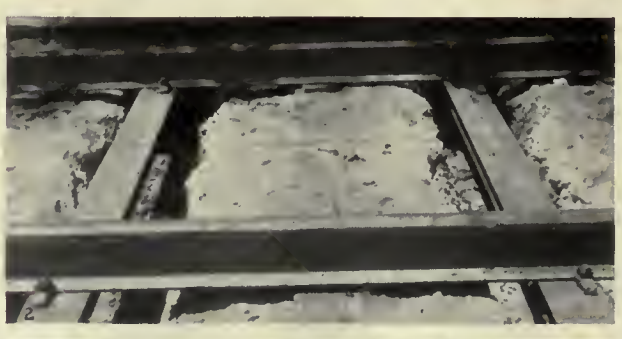
The entire construction was carried on progressively and, with the exception of about ten hours after completing a section of concrete, there were no interruptions to car service over this track. It was felt that no harm would result to the concrete where the rails were firmly supported on the wood ties. In fact, close examination along the rails, after the concrete had set, failed to disclose any movement having taken place between rail and concrete.

### Total Cost $8.18 Per Foot

The accompanying table itemizes the cost of this construction, including all charges such as engineering superintendence, accounting, interest on idle investment and trucking expense. In addition, the complete cost of removing old track and paving has been shown separately, making the total cost $8.18 per foot for removal of old track and complete reconstruction with new. The cost is no greater than that of the previous standard type of construction followed, wherein wood ties were used exclusively. At the same time it is considerably less than it would have been had all steel ties been used, involving, as this would, the laying of temporary track.

It was found, although not anticipated, that after the asphalt paving strips were laid adjacent to the rails, the noise of cars passing over this type of monolithic construction was materially reduced.









No. 1—Air hammers were used in removing old rail and alternate wood ties from pavement.

No. 2—New track was surfaced with aid of shims on undisturbed wood ties imbedded in original concrete base.

No. 3—A one-bag mixer handled the concrete pouring job satisfactorily.

No. 4—Retention of alternate wood ties speeded job of lining and surfacing new track.

# *Modern Problems of*

# Motor Coach Design

## *Demand an Open Mind*

**The wide discrepancy in performance between motor coaches and automobiles is brought out in this article, which is based upon an address presented before the Metropolitan sections of the A.E.R.A. and S.A.E. The author explains some of the design and manufacturing problems with which the motor coach engineer is confronted—particularly in vehicles for long distance, high-speed service**

*By G. A. Green*
Vice-President in Charge of Engineering
General Motors Truck Corporation

THE amazing growth of the motor coach industry is indicated by the fact that during the year ending December, 1927, motor coaches handled 13.5 per cent of all passengers transported by all forms of common carriers. This development and expansion cannot fail to make one optimistic as regards the future. In order to grasp intelligently the significance of what has actually happened during the five-year period ended December, 1927, it is of interest to compare the relative use of various available means of passenger travel as shown in the following table:

| | | Per Cent |
|---|---|---|
| Population | Increased | 8.6 |
| Total common carrier passengers | Increased | 9.1 |
| Riding habit | Increased | 0.4 |
| Steam road passengers | Decreased, 92,826,473 | 9.7 |
| Electric railway passengers | Decreased, 400,044,561 | 0.2 |
| Motor coach passengers | Increased, 1,657,000,000 | 197.0 |

These figures speak for themselves. But the motor coach industry is only in its swaddling clothes. Twenty years ago horse-drawn stages were operated for hire on Fifth Avenue and about that time the first motorized equipment appeared there. It would be wrong to say that progress from a design standpoint during this period has been rapid, for it certainly has not and this is unquestionably due to lack of foresight. Neither the manufacturers nor the largest potential buyers, namely, the electric and steam railroads, were at first able to see the possibilities of the motor coach.

Although the general attitude toward motor coaches has now changed considerably, it seems only fair to point out that this wonderful industry has been built up almost entirely as a result of the vision, foresight and courage of the individual operators who until recently received little if any support from the manufacturers or from the steam and electric railroads. Undoubtedly, many will recall the pressure brought to bear upon the manufacturers by the individual operators to produce suitable equipment; also that the manufacturers were for a long time deaf to the operators' pleas. This forced the individual operator to employ converted trucks and modified automobiles. In some instances, in a small way, operators were even forced by circumstances to manufacture their own equipment.

Perhaps, in thus pointing out the comparatively slow progress in coach development and in calling attention to lack of foresight in recognizing its possibilities, I may ruffle the feelings of some of those associated with the industry from its early days. There is, however, no intention of discourtesy. It seems to me that we should face the facts fearlessly, and the facts, as I see them with respect to the motor coach, are that we have much ground to cover before we can boast of our achievements. This is particularly true with respect to developments to meet the conditions imposed by long-distance, high-speed operations.

In all that I may say regarding the problems of coach design, my comments represent only my personal views in the light of present-day experience. These may necessarily be subject to change. I am convinced, however, that motor coach engineers should not be satisfied with present results and my feeling is that they should leave no stone unturned in the effort to convince their managements of the necessity of expending substantial sums on research and development.

### Coach Design Demands an Open Mind

Considering now specific questions of design, there is room for much difference of opinion as to the possibilities of various ideas that have been advanced. But the proper point of view for the engineer is admirably conveyed by that famous slogan whose author is, I think, responsible more than any other man for the amazing achievements and world leadership of the American automobile industry; namely, "An Open Mind." And it is with an open mind that we should approach such design questions as: (1) larger engines; (2) oil cooling; (3) use of superchargers; (4) improvement, or better still, elimination of the transmission; (5) gas-electric drive; (6) steam propulsion; (7) six-wheel system.

At the present time there is a clearly-defined demand for at least three general motor coach types with a number of different body styles, the so-called street car and

parlor car bodies being fitted to any of the chassis. Very briefly, these chassis types are:

1. A small vehicle particularly suited for school and hotel services. Both automobile and truck chassis with relatively minor changes are generally employed and the design needs no particular comment. Such vehicles accommodate from 8 to 16 passengers and the average automobile power plant provides satisfactory performance.

2. Motor coaches for medium duty services, seating from 17 to 25 passengers. There is a growing demand for this class but the demand has been slowed down by unsatisfactory design. On the whole, coaches of this type have been a disappointment to the user. The power plants were too small and the general construction too light. The maintenance costs have been high. These conditions are changing, however, and satisfactory chassis are now available.

3. Heavy-duty coaches seating from 25 to 40 passengers. This class in the smaller seating capacities is in general use for urban and interurban services, including long-distance coast-to-coast day and night runs. The 40-seat capacity type is a somewhat recent development which has aroused a very considerable interest.

## Long Distance Operations Present Greatest Problems

For urban operation the present types appear to give fairly satisfactory results, although in the larger units added power would be welcome. But in interurban service, particularly the long-distance high-speed runs, available vehicles are underpowered. Briefly, such vehicles do not meet with public approval since they lack that which the public desires most; namely, automobile performance with respect to speed and acceleration. These comments are intended as general and should not be applied to any specific type. It is obvious that more than one size of power plant is required. The very large power output so necessary for heavy-duty parlor car coaches for long-distance service would, in the majority of cases, be unsuitable if used elsewhere. Smaller engines may be employed for urban service because a lower gear ratio can be used.

Today, practically everybody recognizes that all highway vehicles for passenger transport are in the automobile class. The motor coach and the automobile employ the same highway and the public is demanding that motor coaches from the standpoint of safety, comfort, appearance, speed, acceleration and deceleration, compare favorably with the average automobile as now built. Unfortunately, however, the difficulties in the way of meeting this standard of motor coach performance are many and varied. There are wide differences in the type and character of the various services to be met, including speeds, loads, road surfaces, grades, etc. This means that unless a vehicle is specifically designed to meet the needs of a specific kind of service, compromises, mechanically speaking, are inevitable.

It is evident that the manufacturers hold widely divergent views as regards mechanical fundamentals. For example, the purchaser is offered power plants of varying types possessing in total from four to twelve cylinders. He may also acquire single- or dual-drive installations for both gear and gas-electric; and before very long, steam may become a factor. The net result is a certain kind of confusion on the part of the buyer. In a general way, we know that there is a vast difference between automobile and motor coach performance, which is to be expected in view of the fact that the so-called heavy-duty motor coach engines as now commonly used displace only from 450 to 500 cu.in.

## Coach Performance Far Below Automobile

To be specific, let us compare the actual high gear acceleration values (of this year's automobiles and motor coaches) under laden conditions in terms of miles per hour per second at from 10 to 35 m.p.h. Average high gear acceleration value for the automobile is 2.262; the maximum 2.53. The corresponding motor coach figures, considering both urban and interurban equipment of various seating capacities, are 0.5 and 1.25 respectively, with a full seated load. It should be mentioned that 1¼ m.p.h.p.s. is an unusually good performance as judged by present standards. To the best of my knowledge there is only one motor coach which will meet this figure, and that is the Yellow model W parlor car. Here, however, in round figures there is a 100-hp. engine for a 17-passenger vehicle, the unladen weight of which is in the neighborhood of 10,000 lb. Briefly, it is clear that automobile acceleration rates are from two to five times the best obtainable performance of motor coaches.

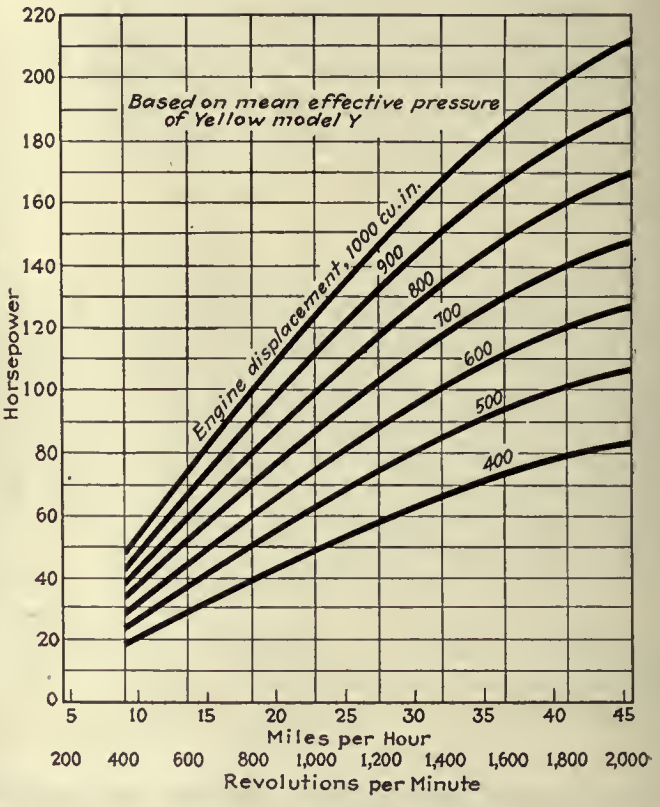



**Fig. 1—Horsepower output for engines from 400 cu.in. to 1,000 cu.in. displacement, assuming no change in efficiency resulting from the increase in engine size. Calculations are based on mean effective pressure of Yellow model Y**

In order to present clearly the nature of the motor coach performance that can be expected as a result of the employment of engines of widely varying displacements, the accompanying graphs have been prepared, showing horsepower output of engines displacing from 400 to 1,000 cu.in., the corresponding torque, respective acceleration and hill climbing ability, respective hill climbing distances, and respective acceleration values.

In the preparation of these charts certain assumptions

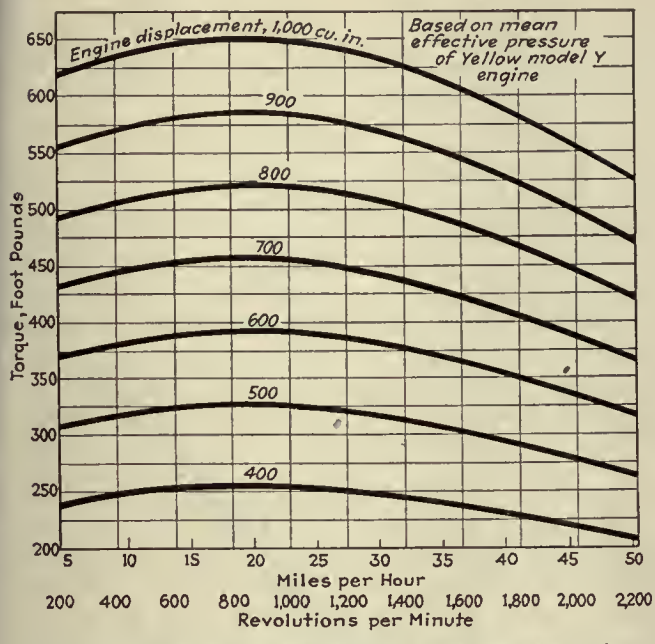



**Fig. 2—Torque output per engine for engines from 400 cu.in. to 1,000 cu.in. displacement assuming no change in efficiency resulting from the increase in engine size**

were made with respect to rear axle ratio, tire size, wind resistance, rolling resistance, efficiency and weight. The mean effective pressures of the Yellow model Y were used in arriving at the horsepower and torque figures. The data can be considered as applying specifically to interurban high-speed equipment. The weight, 19,250 lb., is not abnormal since it includes a full complement of both passengers and baggage. It should be noted that the calculations assume no change in the efficiency of the power plant or drive mechanism resulting from increased engine size; a uniform vehicle weight, irrespective of engine displacement; and the same relative power consumption for all accessories.

In the accompanying Fig. 1 the engine revolutions per minute, miles per hour and horsepower are shown for engines from 400 cu.in. to 1,000 cu.in. displacement. It will be seen that the maximum power output is available at 2,000 r.p.m., which is equivalent to a road speed of 46 m.p.h. The 400-cu.in. engine produces a maximum of 82.5 and the 1,000 cu.in. 212 hp.

In Fig. 2 are shown the engine revolutions per minute, miles per hour and torque, for engines from 400 cu.in. to 1,000 cu.in. displacement. The maximum torque is available at 800 r.p.m., which is equivalent to a road speed of 18 m.p.h. The curves are fairly flat between 400 and 1,400 r.p.m. With the 400-cu.in. engine the maximum torque is 256 ft.-lb. With the 1,000-cu.in. engine the corresponding figure is 650 ft.-lb.

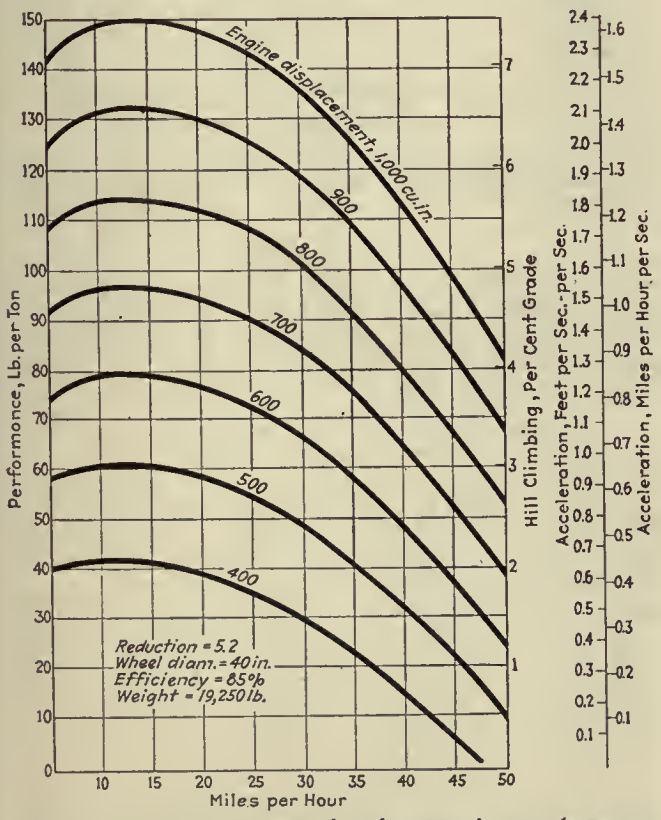



**Fig. 3—Graphical comparison of performance in pounds per ton, acceleration, and hill climbing ability in high gear for engines from 400 cu.in. to 1,000 cu.in. displacement. Vehicle weight is assumed to be 19,250 lb. and to remain constant for all engine sizes**

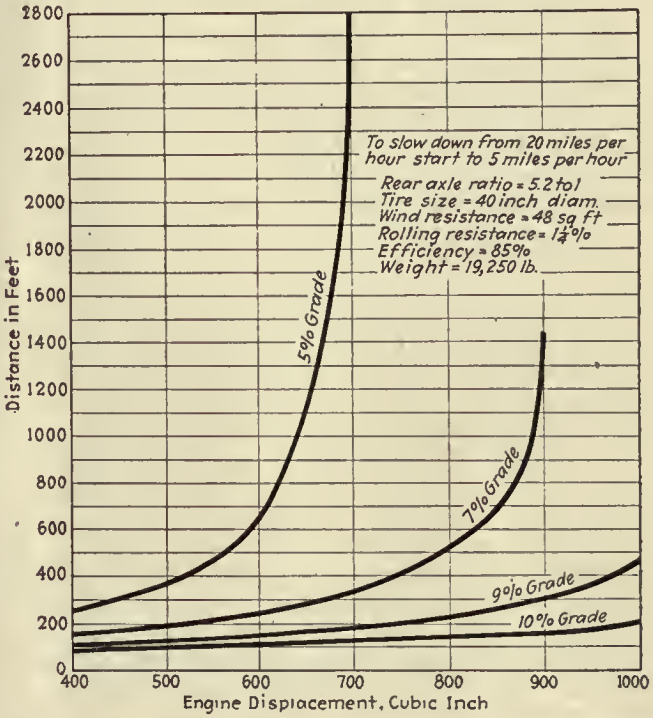



**Fig. 4—Hill climbing distances in high gear on grades of 5 per cent, 7 per cent, 9 per cent and 11 per cent for engines from 400 cu.in. to 1,000 cu.in. displacement, assuming constant vehicle weight of 19,250 lb. and constant engine efficiency. The calculations are based upon approaching the grades at 20 m.p.h. vehicle speed**

### 1,000-Cu.In. Engine Accelerates 1.63 M.P.H.P.S.

Fig. 3 shows the performance in pounds per ton, acceleration in feet per second and in miles per hour per second, and hill climbing ability on grades of from 2 per cent to 7 per cent, for engines from 400 cu.in. to 1,000 cu.in. displacement. The assumed weight of the vehicle is 19,250 lb. It is interesting to note that the maximum acceleration value with a 1,000-cu.in. engine is 1.63 m.p.h.p.s. and that this is effective at a road speed of 15 m.p.h. It will be seen that a 400-cu.in. engine will climb a 2 per cent grade and that a 7½ per cent grade can be negotiated with a 1,000 cu.in. engine. The

DIMENSIONAL RESTRICTIONS STATE MOTOR VEHICLE LAWS

| Maximum Length | | Maximum Width | | Maximum Height | |
|---|---|---|---|---|---|
| 28 ft..... | 2 states | 84 in..... | 1 state | 12 ft..... | 4 states |
| 30 ft..... | 9 states | 90 in..... | 7 states | 12 ft. 2 in..... | 1 state |
| 33 ft..... | 6 states | 92 in..... | 1 state | 12 ft. 6 in..... | 12 states |
| 35 ft..... | 2 states | 93 in..... | 1 state | 14 ft. 6 in..... | 6 states |
| 40 ft..... | 3 states | 96 in..... | 31 states | No restrictions. | 26 states |
| No restrictions. | 27 states | 102 in..... | 1 state | | |
| | | No restrictions. | 7 states | | |

curves in Fig. 4 are based on approaching the bottom of the hill at a speed of 20 m.p.h., and show the distances on grades of 5 per cent, 7 per cent, 9 per cent and 11 per cent that can be climbed by engines from 400 to 1,000-cu.in. displacement. The vehicles are considered as having stalled when a speed of 5 m.p.h. has been reached. It is interesting to note that engines of the following displacements are required in order to climb these grades: 5 per cent, 700 cu.in.; 7 per cent, 900 cu.in.; 9 per cent, 1,182 cu.in.; 11 per cent, 1,406 cu.in. Actually a 1,000-cu.in. engine will stall on a 9 per cent grade after reaching 450 ft. and on an 11 per cent grade after having reached 200 ft. It was previously stated that these calculations are all based on high gear performance. Of course, in actual practice stalling would not take place since the operator would shift gears before this occurred.

### 1,425-Cu.In. Engine to Duplicate Automobile Acceleration

The graphs in Fig. 5 show acceleration values in miles per hour per second and feet per second per second from 10 to 25 and 10 to 35 m.p.h. These curves are of special interest since they permit a ready comparison to be made between the relative acceleration abilities of the automobile and motor coach. It was previously shown that under laden conditions the average 1928 automobile acceleration rate from 10 to 35 m.p.h. is 2.262; the maximum 2.53. Now to duplicate this condition with a motor coach having the characteristics as outlined in the graphs would require engines displacing 1,425 and 1,605 cu.in. respectively. Such engines would be capable of delivering, respectively, about 302 and 340 hp. These are theoretical figures. In actual practice considerably more power would be needed than these figures indicate, and it is obvious that excessive engine sizes would be required to approximate automobile performance.

Consider for a moment some of the practical problems involved in producing heavy-duty motor coach engines. In the first place, the designing and development, including samples, tests, patterns, tools, jigs and fixtures, would require an expenditure of at least $500,000 to produce what might be termed a heavy-duty engine. This expenditure is based on limited tooling to provide for around 2,000 units annually. It is possible to employ heavy-duty motor coach engines modified in various respects for marine purposes, rail cars, tractors and the like, but this kind of business is highly specialized and with the exception of the tractor no great volume is in sight. Unfortunately, with the tractor, first cost is an all-important issue and this practically rules out the possible use of the motor coach engine. Producton possibilities are therefore very limited.

### Large Engines Introduce Complications

With larger engines the tire mileage cost will be greater. Larger tires will be needed to carry properly the additional weight of both engine and chassis. Then, also, more rapid acceleration means increased tire wear. Obviously the larger the tire the more difficult the steering. Furthermore, tire diameter increases adversely affect the turning radius.

A larger engine will project further into the body with a resultant decrease in passenger capacity. This may be partially offset by permitting the engine to project behind the dash but there is a limit to what can be done in this respect. With the existing so-called heavy-duty engines an average parlor car, the over-all length of which is held within 30 ft., cannot accommodate more than 29 passengers with any reasonable degree of comfort. Assuming an engine of 700 cu.in. capacity or greater, and even taking into account the maximum permissible projection

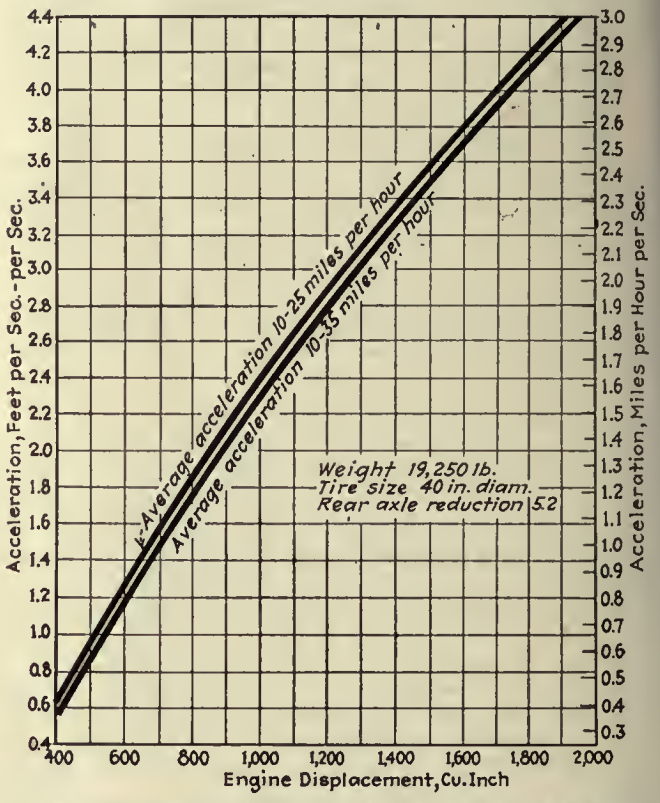



**Fig. 5—Acceleration values for various engine displacements assuming constant vehicle weight. Average 1928 automobile acceleration rate from 10 to 35 m.p.h. is 2.262 and the maximum 2.53**

behind the dash, in all probability the seating capacity would be automatically reduced to 25 passengers unless, of course, the over-all coach length is arbitrarily increased, which would rule out this type of equipment from 11 important states.

### Further Complications Are Presented by Larger Engines

The drive mechanism must be strengthened throughout, which means the enlargement of the clutch, transmission, propeller shaft and final drive. Naturally, considerable additional weight will result. In effect, a very large engine will necessitate what practically amounts to a new chassis, with resultant designing, testing, tooling and development expenditures of possibly another $500,000.

Larger engines present a cooling problem as well. With a single engine installation the frame determines the width of the radiator; the driver's vision and ground clearances determine the height dimension; thermal conditions, the thickness of the core; the power losses determine the amount of air that can be drawn through the core. At present with some designs as much as 10 per cent of the available engine output is at times used to

drive the fan. As an average, probably from 2½ to 5 per cent of the power output is so employed constantly. This is a factor of considerable importance, particularly when one considers that a corresponding percentage of the total fuel bill is involved.

There is, of course, the alternative of providing two engines, but there are a number of difficulties; for example, seat arrangement, cooling, prevention of heat and odors entering body, accessibility, and last but not least, added upkeep cost resulting from the dual drive system. It should also be pointed out that where two engines are employed the cooling problems are as great, if not greater than, with the single unit, and a point not to be lost sight of is that two relatively large engines will be needed and the difficulties to be encountered resulting from their projection both above and below the frame line cannot be discounted.

With any very large increase in engine displacement a greater average fuel consumption is to be expected, but the extent of the increase will depend largely upon the character of the operation and the skill of the operator. Naturally there is a loss in efficiency when very large engines are operated at part throttle. If it were possible to considerably increase the engine output without adding weight to the engine or other chassis parts the situation would be less serious, but unfortunately this cannot be accomplished.

### Automobile Performance Improbable

Despite all of the design problems presented, however, there is a persistent demand for larger engines. One point stands out with unmistakable clarity; namely, it is highly improbable that the performance of an internal combustion engined motor coach can ever be expected to parallel that of the average automobile. But it is also obvious that engines must be made available which will permit of sustained high vehicle speeds. There are many services where sustained speeds in excess of 60 m.p.h. are absolutely safe. But such engines should be capable of giving reliable service of this kind day after day, year after year, with only the absolute minimum of attention. Vehicles in this type of service will regularly cover from 75,000 to 100,000 miles annually and, assuming proper design, practically no attention should be required other than periodic examinations and cleaning. It is needless to stress the reliability factor, particularly in connection with long-distance operation. Such vehicles frequently do not return to their respective divisions for weeks at a time, and when one considers the immense annual mileage, it will readily be seen that the actual time available for inspection and repairs is, as a rule, quite limited. Of course, failures of any kind are to be deplored, but the results of a failure of a motor coach on a long-distance run are of immeasurably greater consequence than in city service.

Six-cylinder engines in excess of 500 cu.in. displacement cannot be expected to give economical service if turned over for very long periods in excess of 2,000 r.p.m. Furthermore, the size and weight of six-cylinder engines becomes out of all proportion where a very large power output is required. It seems reasonably clear that engines displacing beyond 600 or 700 cu.in. should be of the V type, not the least of the advantages being the question of space occupancy. Generally speaking, with large engines the length factor is determined by the bearings and not by the cylinder bores. For this reason, among others, a square engine should be considered, and since for a 1,000 cu.in. engine a six would require 6x6-bore and stroke, an eight 5½x5½, and a twelve 4¾x4¾, the evidence points to the largest number of cylinders; namely, twelve. Unless supercharging becomes a factor in increasing coach engine power, it seems quite evident that future heavy-duty parlor car engines will displace from 900 to 1,000 cu.in.

### Other Possible Improvements Require Study

*Superchargers*—Concerning the possibility of supercharging, it is unquestionably a matter deserving of the closest possible scrutiny. Many passenger car engineers disregard this issue altogether, preferring the popular annual reaming process for increasing engine output. Of course, this is the easiest way out but there is a limit to the possible size of motor coach engine cylinders, and engines in excess of 700 cu.in. represent a tremendous mass of metal, take up a lot of room and cost a lot of money to buy and to maintain. Tests made to date indicate that supercharging is within the realms of possibility. The best scheme appears to be the high-pressure type blower of large size operated at relatively low speeds. Unfortunately, however, there is little or no likelihood of developing superchargers that may be attached to existing engines for the engine and supercharger design must be worked out jointly.

*Transmission*—Transmission design has changed very little since the first automobile was built—a rather discouraging state of affairs—and no matter how one may reflect on the situation, it is little short of amazing that such a barbarous piece of mechanism exists in this day and age. The problem of gear shifting, of course, is still with us, but the question of noise is the vital issue. There is no such thing as a quiet transmission, silence being merely a relative term.

Everyone appreciates the amazing developments that have taken place with regard to automobile design. Unfortunately, however, but a very small percentage of the brains employed on this work have been devoted to the transmission question. The weaknesses are recognized, but in automobile design the only remedy found to date is the enlargement of the engine. Hence the customary annual reaming operations on engine bores. Actually, automobile engines have now reached such proportions that transmissions can be considered as auxiliary devices, their use being primarily devoted to the business of reversing the motion of the vehicle. But a different condition is faced with the motor coach, for no matter how we enlarge the engines, still the transmission will be required to perform a considerable amount of service and the higher torque which must be transmitted through our future transmissions will increase rather than decrease our difficulties.

### Manufacturers Not Asleep

*Gas-Electric Drive*—From these remarks it should not be concluded that manufacturers are entirely asleep at the switch. Experiments are constantly being made with various forms of variable gearing. Then there are, of course, the possibilities of electricity and, last but not least, steam. It is considered by some that the gas-electric will be the final solution. Perhaps this is so, but the present electrical systems are heavy and expensive. The approximate weight of single or dual gasoline-electric equipment for use in connection with an engine developing around 100 hp. is from 1,900 to 2,100 lb., and the cost is in the neighborhood of $1 per pound. These figures speak for themselves.

It is generally recognized that the characteristics of the

average motor coach engine are not suited to the electrical equipment now available, and it has been suggested that the motor coach industry should produce entirely special engines, but the enormous development cost is prohibitive. Briefly, the average motor coach manufacturer is reluctant to place himself unqualifiedly behind the gas-electric drive because he is not sure that the electrical manufacturers will move with the times. Mention should be made of the fact that the gas-electrically propelled motor coaches as now built by the various American manufacturers are, generally speaking, mechanically sound, the only real objections being high fuel consumption, weight and cost.

### Steam Offers Possibilities

*Steam Propulsion*—It is somewhat surprising that steam has not played a more prominent part in the motor coach industry. Perhaps here again the chief reason is that only a very limited percentage of the total available brains has been engaged upon the solution of the various difficulties. At first sight steam is the ideal solution, but little or no success has attended the various developments which from time to time appear. Nearly all steam-propelled vehicles give a spectacular performance, yet none of them have satisfactorily withstood the acid test of time and distance, but this does not mean that steam is out of the picture. In fact, future developments along this line are assured. How successful they will be it is hard to foretell. But the tremendous advantages, such as maximum torque at zero speed and absolute silence, are irresistibly attractive. However, steam as a factor in the motor coach industry is still far distant and in all probability the tremendous advantages have corresponding disadvantages—at least this has been the history of the past.

*Oil Cooling*—The following potential advantages are offered by oil cooling: Easier starting, since lighter oils may be employed; less oil consumption, since the viscosity may be kept more nearly constant; less cost because more miles per gallon can be expected from relatively lower priced oils; less wear due to better lubrication throughout, as a result of the ability to maintain a higher average viscosity; longer bearing life due to the decreased tendency of the babbitt to soften as a result of heat; less carbon formation resulting from the use of lighter oils having a lower carbon content.

The modern high-speed interurban motor coach is required to operate for very long periods with the engine delivering a large percentage of its total power output. This condition introduces a number of complications, particularly with respect to lubrication. As a result of the accumulated heat, many of the oils commonly used tend rapidly to decrease their viscosity, in some instances to such an extent that the oil film is no longer capable of supporting the pressure imposed upon it.

With practically all aircraft engines provision is made for oil cooling. It would be difficult, if not impossible, to run these engines successfully otherwise, and the operating conditions of motor coach and aircraft engines are in some respects comparable, since high duty for continuous periods is one of the controlling issues in both cases. From the standpoint of decreasing operating expenses generally, in so far as the engine is concerned, the influence of oil cooling cannot be over-estimated.

*Six-Wheel System*—That this system is going to play an important part in the future development of the heavy-duty motor coach there is little doubt. This statement is made bearing in mind the unsatisfactory service received from the earlier American models. There has been much loose talk concerning the six-wheel system with respect to tire economy, riding properties and roadway damage. With present six-wheel designs there is considerable doubt in my mind if economy exists with respect to tires, and in so far as riding properties are concerned it can be readily demonstrated that just as good, if not better, results are obtainable with the conventional system. *But the advantages* are clearly in favor of the six-wheel system as regards possible roadway damage, and it is more than probable that the six-wheel system can be made to ride better than the conventional arrangement and can be made to give better tire mileage. Furthermore, there is another point; namely, that with the six-wheel principle properly executed, so-called mass transportation equipment, whether used in urban or interurban service, can be designed with a relatively short wheelbase without excessive rear or front overhang. The importance of this cannot be over-emphasized.

You may say that all of this is poor sales argument for present standard coaches. I don't think so, my feeling being that the average operator will be glad to know that manufacturers do not think that they know it all. I think operators will also be glad to know that manufacturers are continually experimenting with new devices of one kind or another. Then the fact that someone has sufficient courage openly to face the definite trend in public opinion toward motor coaches with automobile performance and to show in a general way some of the difficulties of attainment, should be welcomed.

### No Radical Changes Imminent

To allay the fears of operators who have purchased or are about to purchase equipment, as regards the possible proximity of major motor coach design changes and new developments I should like to say that such fears are, to the best of my knowledge and belief, groundless. In short, we are not on the eve of startling events. It is, of course, evident that the more important manufacturers are carrying out experimental and developmental projects of one kind or another, but manufacturers have learned from experience that it is wise to make haste slowly, otherwise service costs soon absorb profits and dissatisfied customers mean an immediate and permanent loss of business.

## Public Service Buses Carry Foreign Visitors on Long Trip

EIGHT buses of Public Service Co-ordinated Transport covered 2,500 miles each in a single chartered trip during October. The group carried consisted of some 200 members of the automobile club of Germany, who came to this country to study the methods of automobile manufacture. The trip began on Oct. 10 from the Hotel Pennsylvania, New York, and night stops were made at Philadelphia, Washington, Uniontown, Pa., Columbus, Cincinnati, Indianapolis, Chicago, Detroit, Hamilton, Niagara Falls, and Binghamton. With an average mileage per bus of 2,500, the total miles run were 20,000. The total consumption of gasoline was 3,350 gal., and 158½ gal. of oil were used.

The only delay during the entire trip was a broken ring gear on one of the buses between South Bend and Detroit, but the passengers were transferred to another bus, and the one disabled was soon repaired and in its customary place in the line-up the following morning.




This express passenger electric locomotive was built in Japan for the Government Railways

# New Express Passenger Electric Locomotives in Japan

**Recent equipment for the Japanese Government Railways includes seven 1,800-hp. high-speed passenger locomotives, built in Japan. Details are given of one supplied by the Kawasaki Dockyard Company, Ltd.**

PRESENT plans of the Japanese Government Railways for the main line electrification of sections in the heavy grades and tunnels are quite comprehensive. Much of this work is in the neighborhood of Tokio. Seven high-speed electric locomotives built in Japan have lately been added to the equipment and will be used in express passenger service on the line from Tokio to Kosu, about 100 miles. The accompanying illustrations show a locomotive built by the Kawasaki Dockyard Company, which, with three other large electrical manufacturers in Japan, supplied the equipment mentioned.

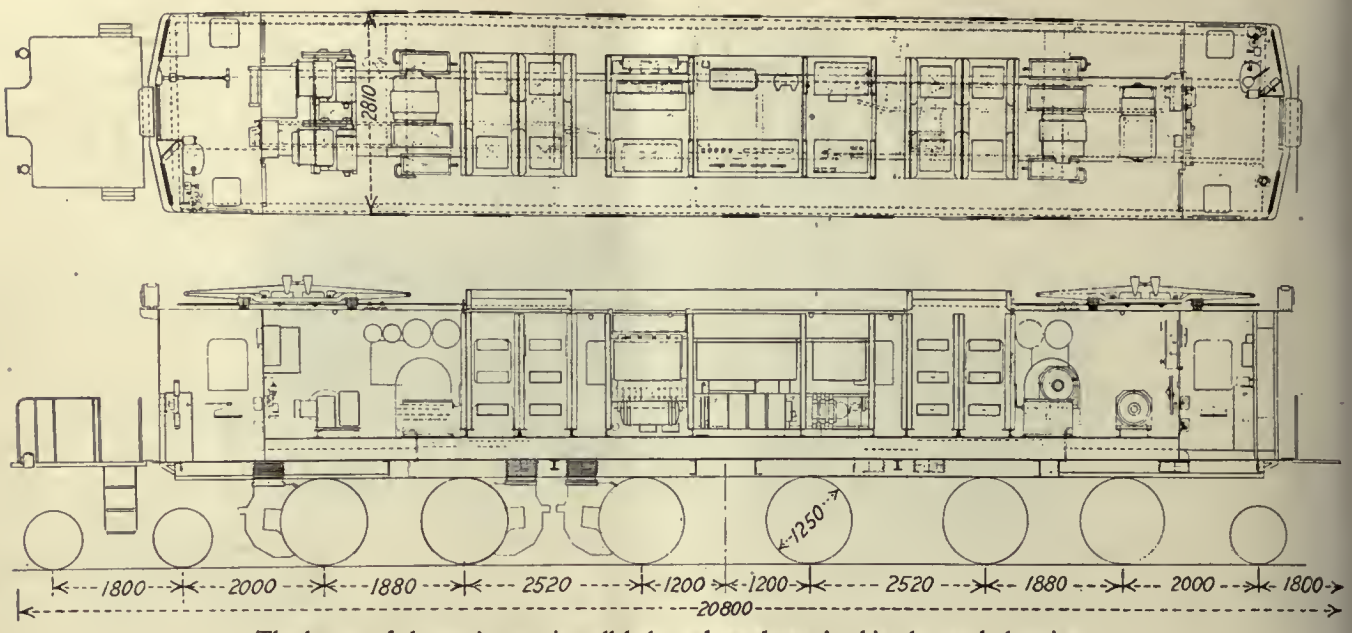
The locomotive is of the articulated truck type with six main driving axles arranged for gear drive, with a small guiding four-wheel truck at each end. The principal dimensions, weight, etc., of the locomotive are shown in the accompanying table. The specification relating to starting provides that the locomotive should start from rest a train weighing from 500 to 700 metric tons on a rising grade of 1 per cent and should attain a speed of 50 km. (31 miles) per hour on 1,350 volts.

DATA OF LOCOMOTIVE BUILT FOR TOKIO-KOSU LINE

| | |
|---|---|
| Truck gage | 1,067 mm. or 3 ft. 6 in. |
| Total length over buffers | 20,800 mm. or 68 ft. 3½ in. |
| Rigid wheelbase | 4,400 mm. or 14 ft. 5 in. |
| Driving wheel diameter | 1,250 mm. or 4 ft. 1½ in. |
| Leading wheel diameter | 940 mm. or 3 ft. 1 in. |
| Over-all width over platform | 2,810 mm. or 9 ft. 2¼ in. |
| Hourly rating | 1,350 kw. |
| Speed at hourly rating | 45 km.p.h. or 28.1 m.p.h. |
| Normal maximum running speed | 90 km.p.h. or 56.2 m.p.h. |
| Total weight of locomotive | 106 metric tons or 233,200 lb. |
| Supply voltage | 1,500 volt d.c. |

The mechanical and electrical parts follow the standards of the Japanese Government Railways. On each of the six main driving axles is mounted an axle-hung geared motor. To provide smooth transmission of the torque between the pinion and gear, the latter is of the spring gear type. The motor frame is of cast steel. Forced ventilation is furnished by two motor-driven blowers, the air being passed not only over the armature and the field coils but also through ducts in the armature cores. The average supply voltage is 1,350 volts, and as there are always at least two armatures in series, there is normally a maximum of 675 volts across any armature. The control system is arranged to give series connection with six armatures in series, series parallel with two parallel groups of three in series, and parallel with three parallel groups of two in series. Resistance steps are provided in each motor grouping, there being twelve series notches, eight notches with three motors in series and eight notches with two motors in series, thus insuring even acceleration. In addition, two weak-field notches are provided for speeding up the motors. The main grid resistors are designed so that their maximum temperature rise will not exceed 250 deg. C.

The control system is of the electro-pneumatic type, the line switches, resistance switches and combination




**The layout of the equipment is well balanced, as shown in this plan and elevation**

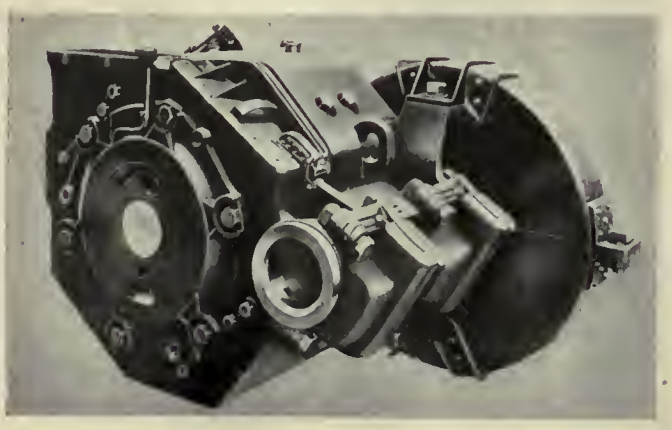
switches consisting of compressed air-operated contactors. The reversing switches are of the drum type, also air operated. All air valves on these switches are operated electrically from a 100-volt supply, obtained by a 1,500/100-volt, 2-kw. motor generator. This motor generator is designed to give a constant voltage irrespective of the supply voltage.

The valve operating circuits are controlled from the master controllers, one of which is mounted at each end of the locomotive. The controllers are fitted with two handles, one for reversing and the other for grouping motors, resistance and field control. A motorman's cab is provided at each end of the locomotive body, the motorman's seat being located on the left-hand side of each cab.

The train is fitted with vacuum brakes, but the locomotive itself is separately equipped with air brakes of the Westinghouse 14-EL type. Accordingly, the equipment includes an air compressor and a vacuum pump, both electrically driven, the latter for operating the train brakes and the compressor for operating the locomotive air brakes. This duplicate arrangement will continue only until all trains can be equipped with air brakes, according to the present plans of the Government Railway Department.

The general arrangement of the locomotive equipment is shown in the plan and elevation. The arrangement adopted gives great accessibility of auxiliary motors and control gears, combined with a uniform distribution of the weight throughout the locomotive. Two through corridors, one along each side of the locomotive, connect the two motorman's compartments. These corridors facilitate inspection of the auxiliary machines and switch gears.

The control portion of the locomotive is in the high-tension switch-gear compartment. There are two auxiliary machine compartments next to the motorman's cab, each separated from the high-tension compartments by a grid resistor compartment. Suitable battery groups are provided in the auxiliary machine compartment to act as a spare of the motor-generator. Change over is effected by a switch on the auxiliary circuit switch panel. The auxiliary circuit includes a control circuit and a lamp circuit, and its nominal voltage is 100 volts. Overload protection is provided by a G-E type high-speed circuit-breaker. There is a choke coil in connection with each pantograph circuit, and an aluminum-type arrester insures protection from lightning and surges. The test run of the locomotive was very successful.



**The main traction motors use 1,500 volts direct current**

## Evansville Freight Shipments Increase

FREIGHT shipments by the traction line route in and out of Evansville, Ind., are showing a steady increase in volume, particularly on the line between Evansville and Owensboro, Ky., according to G. R. Millican, general manager of the Evansville & Ohio Valley Railway. Jobbers and merchants are availing themselves of this service. Through shipments from Evansville to Owensboro are now offered twice a day. The traction car leaving Evansville in the morning insures delivery of freight in Owensboro the same afternoon, while freight leaving Evansville by traction at night is delivered early the morning following.

Both the Evansville & Ohio Valley line and the Evansville, Suburban & Newburgh line, are hauling a great deal of coal at the present time, there being a large number of coal mines scattered along these routes. Many southern Indiana mines now are operating on full time.

# New National

# Bus Regulatory Measure

**Full text of bill introduced by Representative Parker to replace law proposed last year. New measure believed to overcome previous objections**

ANOTHER attempt is to be made at this session of Congress to bring about a degree of order in the regulation of interstate buses by bringing them under regulation. To that end a new bill has been introduced by Representative Parker, as noted in the JOURNAL for Dec. 22, page 1097. The effort made in the present bill is to overcome the objections made to the one lost in the last session largely because of the objection that the measure as it then stood, while it provided for regulation, might tend to hamper the free development of the bus and truck industry. Under the new bill certificates of convenience and necessity are necessary for interstate bus lines, for which applications must be filed with the Interstate Commerce Commission. The so-called grandfather clause will date from Nov. 1, 1928. To go into a lengthy analysis of the provisions of the measure, however, is not necessary since the bill in full is presented herewith.

## *A Bill*

**To regulate interstate commerce by motor vehicles operating as common carriers of persons on the public highways**

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled.*

DEFINITIONS

*Section 1.* (a) The term "corporation" shall include a corporation, company, association, or joint-stock association.

(b) The term "person" shall include an individual, firm, or co-partnership.

(c) The term "Board" means the commission, board, or official (by whatever name designated in the laws of a state) which, under the laws of any state in which any part of the service in interstate commerce regulated by this act is to be performed, has or may hereafter have jurisdiction to grant or approve certificates of public convenience and necessity or other form of permit to motor vehicle common carriers in intrastate commerce over the public highways of such state; or, if there be no such authority in the State, then as to that state it means the commission, board, or official which such state may hereafter create or designate.

(d) The term "commission" means the Interstate Commerce Commission.

(e) The term "certificate" means a certificate of public convenience and necessity authorized to be issued under the provisions of this act.

(f) The term "public highway" shall include the public roads, highways, streets, and ways in any state, or any political subdivision thereof or in the District of Columbia.

(g) The term "motor vehicle" includes all vehicles or machines propelled by any power other than muscular power and used upon the public highways for the transportation of persons, except that the same shall not include any vehicle, locomotive, or car operated on a rail or rails, or motor vehicles used exclusively in the transportation of property.

(h) The term "motor carrier" shall mean and include any carrier of persons which holds out, announces, or advertises the operation of motor vehicles for compensation in interstate commerce, or which operates or runs motor vehicles over any street, highway, or public place in interstate commerce, and accepts and discharges such persons as may offer themselves for transportation, either at a terminus or points along the way or route on which such motor vehicles are used or operated or may be running. Nothing in this act shall be construed to include buses employed solely in transporting school children and teachers, or taxicabs having a capacity of six passengers or less not operated on a regular route, or buses owned or operated by or on behalf of hotels and used exclusively for hotel patrons.

(i) The term "chartered motor vehicle" means a motor vehicle hired for a specific trip or trips which is subject to the direction of the person hiring the same.

(j) The term "state" includes the several states and the District of Columbia.

ADMINISTRATION OF THE ACT

*Section 2.* (a) It shall be the duty of the commission and of joint boards to be created hereunder acting as federal agencies to administer the provisions of this act. All powers heretofore granted in the Interstate Commerce Act to said commission are hereby extended to it for the purpose of the enforcement of this act and it may adopt uniform rules for the regulation of motor carriers and such rules and regulations as may be necessary for the proper administration or enforcement of this act. Any member of a joint board may administer oaths in a proceeding before such joint board. The general rules governing the time and place of meetings of joint boards and the procedure to be used by them shall be promulgated by the commission after a conference with the state boards.

(b) For the purposes of administration of this act, nothing contained in Section 500 of the Transportation Act, 1920, shall be construed by any joint board, by the commission, or by any court to express a policy of Congress in favor of any other form of transportation as against transportation by motor vehicle or to affect in any manner the issue of a certificate under this act, if the issue of such certificate, after all pertinent facts and circumstances have been duly considered on their merits, is deemed proper in the public interest; and nothing herein contained shall be construed as a declaration by Congress of the relative importance to the public of the several kinds of transportation.

(c) For the purpose of carrying out the provisions of this act the commission shall refer all matters over which it has jurisdiction hereunder (except the rules and regulations it may adopt pursuant to paragraph (a) of this section; the regulations provided in sections 6 (b), 7, 8 and 9; the issuance of certificates to bona fide operators in operation on Nov. 1, 1928, without hearing as provided for in section 3 hereof) to joint boards made up, in each case, of representatives of the boards of the several states in which any part of the interstate operation is, or is proposed to be, conducted. On such joint boards there shall be one representative from each of such states, and such representative shall be designated by the board in such state, either from its own membership or staff, or from the membership or staff of a board interested in the proceedings, as such board may elect. If there be no such board in any state or if the board in any state or states shall fail to designate such representative, the joint board shall function without a representative from such state or states and if the said boards of all such interested

states shall fail to designate representatives the commission shall hear and determine such matter.

(d) The joint board so constituted shall render a decision on matters submitted to it. Such decisions shall thereupon be filed with the commission and all parties to the record notified thereof. The commission in not less than ten or more than thirty days after the filing of a decision by a joint board and notice thereof to interested parties shall issue an order or a certificate in accordance with the decision of the joint board. If a party to the record shall file with the commission notice of an intent to appeal from such decision within ten days after notice thereof such order or certificate shall not be issued until time for appeal from decision of joint board has expired.

(e) The joint board shall keep a record of its proceedings, which shall be filed with the commission. If the joint board is unable to reach a decision within 60 days from the submission of the matter by the parties, unless the time shall be extended by the commission, the commission shall decide the matter upon the record of such proceedings.

(f) If a joint board to which any matter is referred for decision shall fail to start hearing the same within sixty days from its reference, unless the time shall be extended by the commission, such matter shall be heard and decided by the commission.

### Certificate of Public Convenience and Necessity

*Section 3.* No corporation or person shall engage as a motor carrier in interstate commerce on any public highway in any state without having first obtained from the commission a certificate of public convenience and necessity authorizing such operation: *Provided,* That motor carriers in operation on the date of the approval of this act shall have 90 days from such date in which to file application for certificates hereunder and shall have the right to continue in operation until their applications have been finally decided: *Provided further,* That if a motor carrier, or its predecessors in interest, was in bona fide operation over any route on Nov. 1, 1928, and (except as to seasonal service or interruptions of operation over which the applicant or a predecessor in interest had no control) continuously has been so operating since that date and such motor carrier shall make application to the commission for a certificate of public convenience and necessity, it shall be served by the commission with a questionnaire in respect to the matters which, in the judgment of the commission, shall constitute bona fides of operation, which questionnaire the applicant shall answer within 90 days from the receipt thereof: and if it appears from the answers to such questionnaire or from information furnished by any board that the operations of such applicant are bona fide for the purpose of furnishing transportation to the public and of continuing the same for a reasonable period, a certificate shall be issued to such applicant as a matter of course; but if, from the answers to such questionnaire or from information furnished by a board, the commission shall not be satisfied of such bona fides it shall refer such matter to a joint board for decision. A copy of all questionnaires and the answers thereto shall be furnished by the commission to the board of every state in which any part of the service is conducted.

### Applications

*Section 4.* Any corporation or person desiring such certificate shall make application therefor in writing to the commission, which application shall be verified under oath and be in such form and contain such information as the commission by order shall require.

### Hearing on Application

*Section 5.* (a) Hearings on applications of motor carriers in operation on the date of the approval of this act shall be given precedence over hearings on other applications.

(b) In determining whether or not a certificate should be issued, the joint board and the commission shall, among other pertinent matters, give reasonable consideration to the convenience of and necessity to the public to be served thereby of the service by motor vehicle applied for and to existing available transportation agencies and service.

### Certificate

*Section 6.* (a) The joint boards or the commission in deciding the matter of a certificate may authorize the operation proposed, in whole or in part, and may attach to the exercise of the rights granted thereby such reasonable terms, conditions, and regulations as in their judgment the public interest may require, and shall specify the route or routes over which, and the fixed termini, if any, between which the motor carrier is authorized to operate.

(b) Any motor carrier holding a certificate under this act may operate chartered motor vehicles in interstate commerce or may occasionally depart from its regular route for the purpose of providing special service to a point beyond such route, subject to police regulations and according to such rules and regulations as the commission may prescribe.

(c) Certificates issued under this act shall be effective from the date thereof, and shall continue in effect until suspended or revoked. Upon complaint of any board filed with the commission the certificate of a motor carrier may be suspended or revoked, in whole or in part, after hearing by a joint board, for failure to comply with this law or any lawful orders or rules promulgated hereunder.

(d) No certificate issued to a person shall expire solely by reason of death, but a personal representative may operate under such certificate, to the same extent and subject to the same conditions as such decedent could if living.

### Transfer Certificates

*Section 7.* Certificates may be transferred, and the commission shall approve the transfer thereof, subject to the provisions of this act, upon compliance by the transferee with such general rules and regulations as the commission may prescribe respecting such transfers.

### Security for the Protection of the Public

*Section 8.* No certificate shall be issued or remain in force unless the holder thereof shall comply with such rules and regulations of the commission as it shall adopt governing the filing of bonds, policies of insurance or such security or agreement in such form and adequate amount and conditioned as the commission may require for the payment of any final judgment which may be rendered against any such motor carrier arising out of the death of or injury to any passenger or injury to other persons or property as a result of any negligent operation of the motor vehicles of such motor carrier, with power in the commission to permit self-insurance whenever, in its opinion, the financial ability of the motor carrier warrants.

### Rates

*Section 9.* (a) All rates, fares, and charges of motor carriers shall be stated in money, and shall be just and reasonable. Tariffs shall be prepared, filed, and posted in such manner as may be prescribed by the commission.

(b) No motor carrier shall charge or demand or collect or receive a greater or less or different compensation for such transportation of persons, or for any service in connection therewith, between the points named in such tariffs, than the rates, fares, or charges which are specified in the tariffs in effect at the time; nor shall any such motor carrier refund or remit in any manner or by any device any portion of the rates, fares, or charges so specified, nor extend to any person any privileges or facilities for the transportation of persons except such as are specified in such tariffs: *Provided, however,* That any motor carrier authorized to operate under the provisions of this act may issue or give interstate free tickets, free passes, and free or reduced transportation to persons engaged in the service of the carrier.

(c) No change shall be made in any such rate, fare, or charge which shall have been filed and posted in compliance with paragraph (a) of this section except after 30 days notice of the proposed change filed and posted in like manner, which notice shall plainly state the change proposed to be made and the time when the change will take effect: *Provided,* That the commission may, in its discretion and for good cause shown, allow changes upon less than the notice herein specified or modify the requirements of this section in respect to posting and filing of tariffs, either in particular instances or by a general order applicable to special or peculiar circumstances or conditions.

### Appeals

*Section 10.* Any party to the record in any matter submitted to a joint board may appeal within thirty days after receiving notice of the filing of the decision of such joint board to the commission from the decision rendered.

The commission shall decide such appeal on the record made before such joint board and may affirm the decision of such joint board or may set the same aside or modify the same or order a rehearing of the matter or make such other order as the public interest may require.

The commission may stay the issuance of an order putting into effect the decision of a joint board during the pendency of an appeal.

Any order entered by the commission which constitutes a final order under the provisions of this act shall be subject to the same right of relief in court by any party in interest as is now provided for in respect to orders of the commission in the act to regulate commerce approved Feb. 4, 1887, as amended.

### Orders and Notices

*Section 11.* (a) It shall be the duty of every motor carrier as defined in this act to file with the board of every state in which it operates, and with the commission, designation in writing of the name and post office address of a person or corporation upon which person or corporation service of notices or orders may be made on such motor carrier. Such designation may from time to time be changed by like writing similarly filed. Service of notices or orders may be made upon a motor carrier by personal service or by mail on the person or corporation so designated by it at the address filed, or by personal service on such person or corporation. In default of such designation, service of any notice or order may be made by posting in the office of the secretary or clerk of the board of the state wherein the motor carrier maintains head-

quarters and in the office of the commission.

(b) Notice of every decision of a joint board, or of an order or certificate of the commission entered after hearing affecting any motor carrier shall be given to all parties to the record in the proceedings, either by personal service or registered mail.

### Unlawful Operation

*Section 12.* (a) Upon conviction in any federal court having jurisdiction any person or corporation who shall have operated a motor vehicle of any character in willful violation of the provisions of this act, either in his own interest or as the agent of another or shall have otherwise willfully violated any provision of this act, or any lawful order of the commission, shall be fined not more than $100 for the first offense and for any subsequent offense shall be fined not more than $500. Each day of violation of a provision of this act shall constitute a separate offense.

(b) If any motor carrier shall operate in violation of the provisions of this act, or shall fail or neglect to obey any lawful order of the commission, the commission, or any party injured, may apply to any court of competent jurisdiction in any district where such motor carrier is engaged in business for the enforcement of this act or such order; and the court shall have jurisdiction to enforce obedience thereto by a writ of injunction or other proper process, mandatory or otherwise, and to restrain such carrier, its officers, agents, employees, or representatives from further violation of this act or of such order, or to enjoin upon it or them obedience to the same.

### Appropriations for Contingent Fund

*Section 13.* There is hereby authorized to be appropriated out of the Treasury of the United States such sums as may be necessary, to be paid to the commission and held by it as a separate contingent fund, out of which it may meet such expenses of the administration of this act as are incurred by it or by the joint boards.

### Powers of the States

*Section 14.* Nothing in this act contained shall be construed to affect the powers of taxation of the several states or to authorize a motor carrier to do an intrastate business on the highways of any state. It is not intended hereby to interfere with the exclusive exercise by each state of the power of regulation of motor carriers on the highways thereof engaged in intrastate commerce; and, notwithstanding this act, motor carriers operating in intrastate commerce on the highways of a state shall continue to be subject to the laws thereof and motor carriers engaged in interstate commerce hereunder shall be subject to the proper exercise by the state of its police powers.

The commission while acting under authority of this act shall not have any jurisdiction or authority over intrastate commerce by motor carriers and the commission is expressly prohibited from interfering in any way with or attempting to regulate such intrastate commerce by motor carriers.

*Section 15.* Any corporation or person which shall engage in the transportation of passengers by motor vehicle upon the public highways, or which shall own and control a motor carrier which operates such motor vehicles, or which shall purchase and own the whole or any part of the capital stock of a corporation organized or engaged as a motor carrier in the transportation of passengers by motor vehicle upon the public highways in interstate commerce, and for the operation of which motor vehicles a certificate of public convenience and necessity has been obtained as in this act provided, shall be, and it is hereby, relieved from the operation of the "anti-trust laws," as designated in section 1 of the act entitled "An act to supplement existing laws against unlawful restraints and monopolies, and for other purposes," approved Oct. 15, 1914, and of all other restraints or prohibitions by any law, state or federal, in so far as may be necessary to enable it to own, control, and operate, either directly or through a subsidiary corporation, such motor vehicles upon the public highways for the transportation of persons, property, or mail.

*Section 16.* Nothing in this act shall prevent Congress from repealing, amending or modifying this act, or any privilege or right granted thereunder.

### Constitutionality

*Section 17.* If any provision of this act shall be held unconstitutional, either as respects all motor carriers or as respects any motor carrier or class of motor carriers, such invalidity shall not be held to affect any other provision thereof.

## Exhibit Shows Work of Commission

UTILITIES serving Grand Rapids, Mich., are regulated by a city commission, a body which has accomplished much for both the utility group and the city. To portray the work of the utilities department of the commission, an exhibit was prepared and displayed in the City Hall. The Grand Rapids Railroad, the Consumers Power Company, the Michigan Bell Telephone Company and the Grand Rapids Gas Light Company are the four utilities whose activities are portrayed on the exhibit. The portion devoted to the Grand Rapids Railroad has a duplicate of the Charles A. Coffin award certificate, replicas of the gold medal which accompanied the certif-

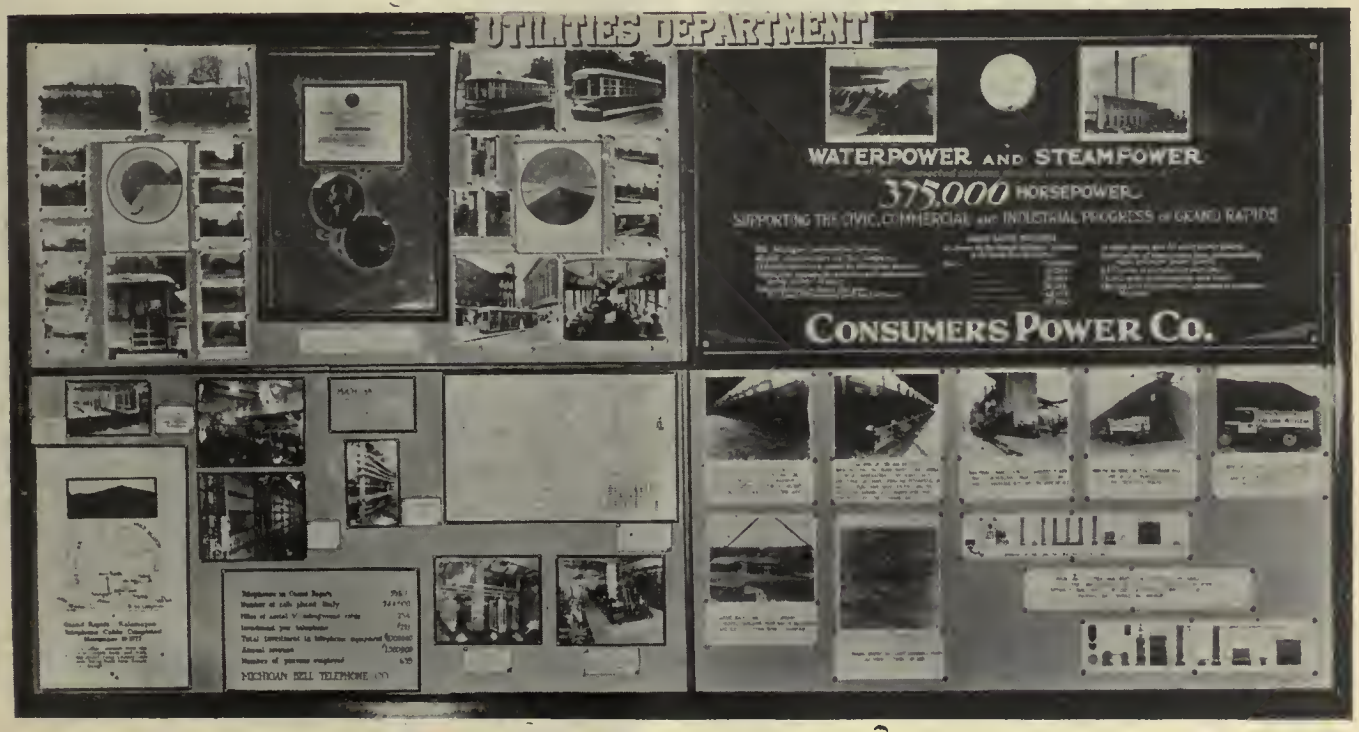



**Exhibit in the City Hall of Grand Rapids picturing the activities of the city's four utilities. The upper left-hand quarter is devoted to the Grand Rapids Railroad**

icate and numerous photographs and charts depicting the company's progress. Much favorable comment on the exhibit has been received from the thousands who have viewed it.

The utilities department is headed by Gerald J. Wagner, consulting engineer.

## Buffalo Tries New Car Stop Signs

AT THE suggestion of one of its employees, the International Railway, Buffalo, N. Y., is experimenting with a new method of marking car stops. The company at present follows the conventional practice of painting a white band around the nearest pole, carrying the words "car stop" written perpendicularly in 4-in. letters.




**I.R.C. acts on suggestion of one of its trainmen in making up new car stop sign**

Recently a trainman suggested that, inasmuch as each car stop is actually a street car service station for the public, this thought be incorporated in the wording of the signs. In line with this suggestion the railway company has repainted one of the poles on Main Street in Buffalo as shown in the accompanying picture. Thus far the only comments heard have been of a favorable nature and consideration is being given to the advisability of similarly marking each of the company's 1973 car stops in the cities of Buffalo, Niagara Falls and Lockport.

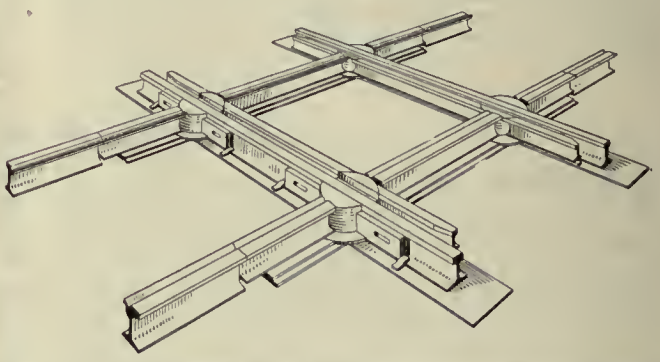
## Chicago Terminal Joins Three Systems

ESTABLISHMENT of the downtown Chicago terminal of the Chicago, Aurora & Elgin Railroad at Quincy and Wells Street as an inbound "Loop" station for the trains of the Chicago, North Shore & Milwaukee Railroad was announced recently by R. S. Amis, general passenger agent of the North Shore Line. Heretofore, persons traveling to Chicago from North Shore Line points have had no inbound station facilities in the downtown business district. The Northshore Line station at 223 South Wabash Avenue is the main Chicago "Loop" station for all outbound stations.

The Wells Street terminal is directly connected by an overhead bridge with the Quincy-Wells Street station platform of the Chicago Rapid Transit Lines, which is a regular stop for all southbound North South Line trains. With its spacious waiting room and restaurant facilities, the terminal is a convenient central location where persons arriving in Chicago over the North Shore Line may be met. The terminal also affords direct connection with trains of the Chicago, Aurora & Elgin Railroad, operating to western suburbs.

## Experience with Flange-Bearing Crossing Over Steam Road Rails

EXPERIMENTS extending over a period of several years have been made by the San Antonio Public Service Company, with electric railway over steam crossings of the type shown in an accompanying illustration. The object at first was to eliminate the severe impact caused by steam railroad trains passing over the flangeways cut out of the railway rails. First crossings of this



**Flange-bearing crossing made at San Antonio with a new design of light construction**

type were installed in 1921. In 1926 another type of flange-bearing crossing was designed, in which two steel castings were used, one for the gage, the other for the side opposite the gage, both of which acted as points of contact for the crossing with the steam railroad rails. A description of this was published in ELECTRIC RAILWAY JOURNAL for Dec. 27, 1927.

It was decided to incorporate in this design, flange-bearing rail the entire length of the street car part, so that, regardless of the depth of the flanges, cars would pass over in the same plane, causing no impact except over the spaces left to accommodate the steam railroad flanges. Four of this type of crossing were installed in the fall of 1927 and four additional such crossings have just been completed. They use L. S. Section 98-451 rail instead of the 7-in., 150-lb. flange-bearing rail for the street car part of the crossings. This design calls for a fill in the groove to within ½ in. of the top of the rail, thus making a lighter construction but retaining at the same time the good features of the heavier crossing.

The steam railroad rails in this type of crossing are not deformed in any way but are held in line by tie clips which are a part of the framework of the crossing, leaving the steam rails free to move longitudinally.

# Practical Ideas *for the* Maintenance Man

## Insulation Tests for Traction Apparatus

By G. L. Moses

*Renewal Parts Engineer Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.*

USE of suitable insulation test voltage in repair shops will reduce the number of pull-ins as it is a satisfactory guarantee of the sufficiency of the insulation. The cost of equipment and additional labor to make such a test is slight, as compared with the saving, because of the reduction in road failures and improvements to the service. Such testing equipment, therefore, pays big dividends. Any insulation test is meaningless unless a sufficiently high test voltage is used to show up the potential faults. For this reason the standard insulation test voltage for traction apparatus, as recommended by the American Institute of Electrical Engineers, has been set sufficiently high to provide a satisfactory factor of safety. The standard test for control apparatus used on voltages of 600 and over is 2¼ times normal voltage plus 2,000 volts, and for motors is two times normal voltage plus 2,000 volts. Assembled apparatus, where a number of individual units are connected, may be tested at 15 per cent lower voltage. The test voltage should be applied continuously for one minute. Alternating current is recommended for making insulation tests.

Equipment which has been overhauled should be in a condition comparable with the original. All dust, dirt and grease should be removed; burnt and cracked insulation replaced; and all the insulating parts painted with an insulating varnish or dipped and baked. After this is done the equipment should be given the same insulation test as is given new equipment. The test voltages recommended for such apparatus are given in Table I. When equipment is only partially overhauled, such as if a motor has the armature rewound and the field coils are not rewound, the completely overhauled parts should be given this test and the remainder may be tested at the depreciated test voltage in Table II.



Type of high-voltage test equipment used in many electric railway shops

At each inspection period the dust and dirt should be removed from the insulation and faulty parts replaced. Grease should be removed from the insulation with benzine or gasoline. Parts which show signs of burning should be scraped clean and painted with an insulating varnish. After the work is completed, an insulation test of 70 per cent of the standard test voltage for new equipment should be applied. The test voltages for this class of apparatus are given in Table II.

TABLE I—INSULATION TEST VOLTAGES COMPILED FROM AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS' STANDARDS TO BE USED FOR APPARATUS WHICH HAS BEEN OVERHAULED THOROUGHLY

| | | | | |
|---|---|---|---|---|
| Line operating voltage | 600 | 1,200 | 1,500 | 3,000 |
| Main circuits to ground control (control app.) | 3,350 | 4,700 | 5,380 | 8,750 |
| Between main circuit leads with switches open | 3,350 | 4,700 | 5,380 | 8,750 |
| Motor leads to ground | 3,200 | 4,400 | 5,000 | 8,000 |
| Control circuits to ground | 2,000 | 2,500 | 2,500 | 2,500 |
| Between control circuit fingers and contacts that are open in operating position | 500 | 500 | 500 | 500 |

For line voltages not listed standard A.I.E.E. test voltage applies.

TABLE II—SUGGESTED VOLTAGES FOR TESTING APPARATUS WHICH HAS BEEN IN SERVICE, AFTER IT HAS BEEN INSPECTED, CLEANED AND THE NECESSARY REPAIRS MADE

| | | | | |
|---|---|---|---|---|
| Line operating voltage | 600 | 1,200 | 1,500 | 3,000 |
| Main circuits to ground (control apparatus) | 2,350 | 3,300 | 3,800 | 6,100 |
| Between main circuit leads with switches open | 2,350 | 3,300 | 3,800 | 6,100 |
| Motor leads to ground | 2,250 | 3,080 | 3,500 | 5,600 |
| Control circuits to ground | 1,400 | 1,750 | 1,750 | 1,750 |
| Between control circuit finger and contacts that are open in operating position | 350 | 350 | 350 | 350 |

For line voltages not listed use 70 per cent of standard A.I.E.E. test voltage.

## Form-Board for Concrete Track Foundation*

By Louis T. Botto

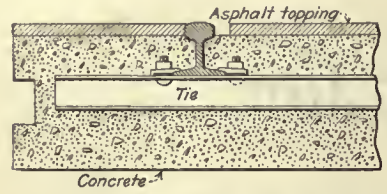
*Superintendent Maintenance of Way Department, San Antonio Public Service Company, San Antonio, Tex.*

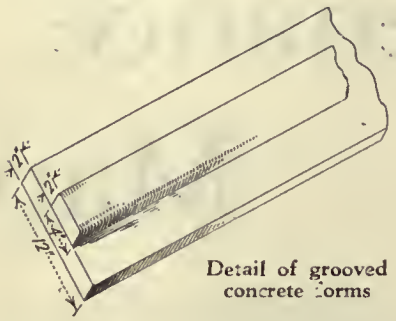


Track construction with forms in place for concrete

IT SOMETIMES happens that, where the concrete paving foundation joins the concrete track foundation, a large crack in the asphalt paving surface appears. This break in the paving is very unsightly and often causes an expensive maintenance charge. With a view to correcting this, a new type of form-board, for use when concreting track

**Submitted in* Electric Railway Journal *Prize Contest.*




Detail of grooved concrete forms

and paving foundation, has been adopted by the San Antonio Public Service Company. It is constructed by nailing a 2-in. x 4-in. timber to the 2-in. x 12-in. plank that had been used previously as a side form for the concrete. After the 2-in. x 4-in. piece has been nailed in position, the edges are adzed round and smooth, so that it can be removed easily after the concrete has set.

This simple and inexpensive construction has proved very successful, as the contractor's concrete makes a kind of mortise joint with the Traction Company's track foundation, and no breakage occurs where used.

## Steam Heater Piping Repaired by Welding

By J. A. Duffy

*Superintendent of Equipment Monongahela-West Penn Public Service Company, Fairmont, W. Va.*

LEAKS in the steam heater piping in the Fairmont carhouse of the Monongahela-West Penn Public Service Company caused consideration to be given some time ago to the desirability of replacing it. The cost of replacement would have been $150, it was estimated. Seeing a chance to save money for the company, the shop force undertook to repair the piping by welding. This was done at a cost of $4 for materials, thus effecting a saving of $146 exclusive of the welder's time.



Welder repairing carhouse heating coils at Fairmont

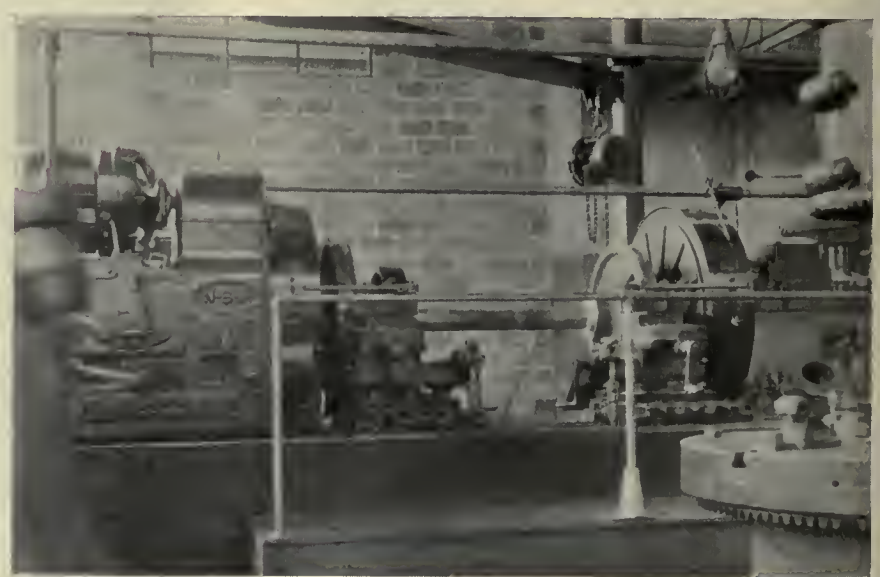
## Wheel Work Speeded Up With New Lathe*

By C. B. Hall

*Chief Clerk Mechanical Department, Virginia Electric & Power Company, Norfolk, Va.*

WORKMANSHIP has been improved and more than half the time saved for wheel turning has resulted through the installation of a new Niles-Bement Pond Company's 42-in. car wheel lathe by the Virginia Electric & Power Company. The new lathe takes care of the turning of all steel wheels for the railway equipment which range in diameter from 18 in. to 42 in. Large shaft work is also done in the lathe. Previous to the receipt of this lathe, a 36-in. Lodge & Shipley lathe was used for this work.

Wheels are moved into and out of the machine by means of a revolving crane of 6 in. channel and 7 in. iron, with an 8-in. upright and 6-in. boom with a chain-fall attachment.



New wheel lathe as installed in the shops at Norfolk

## Emery Wheel Glass Visor

EVERY machine is carefully guarded and nothing is left undone to make working conditions safe in the shop of the Staten Island Rapid Transit Railway, Staten Island, N. Y. In the case of the emery wheels, two precautionary measures are taken to protect the eyes of the employees from flying particles of emery. Each wheel is equipped with a guard and a stationary glass visor. In addition the employees are compelled to wear goggles. A conspicuous sign over each wheel informs the men constantly that this is necessary.



Glass visors and signs warning workers to wear their goggles have reduced emery wheel accidents

The visor is shaped to conform to the contour of the wheel guard and is attached to the guard at an angle to permit an unobstructed view of the work. The brackets and frame are made from $\frac{1}{32}$-in. sheet iron. The glass is installed in guides, designed so that a glass can be removed or installed easily.

Since this double precaution has been taken emery wheel eye injuries have ceased.

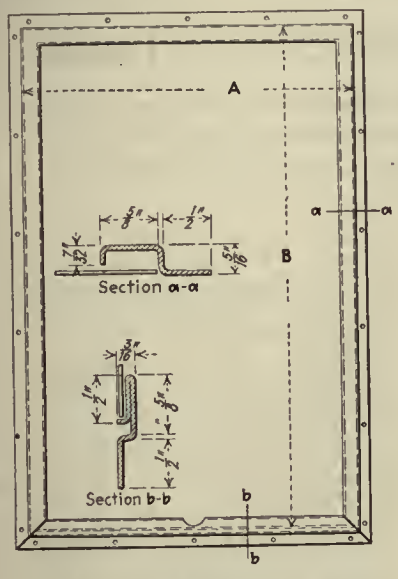
**Submitted in* Electric Railway Journal *Prize Contest.*

# *New Offerings of*

# Useful Equipment

## Frames for Dashers

BELIEVING that pedestrian traffic forms a large part of the potential market for car transportation sales, and that a neatly framed sign is an important help toward increasing car riders, the J. G. Brill Company, Philadelphia, Pa., is now marketing dasher sign frames. These are available for standard size cards.

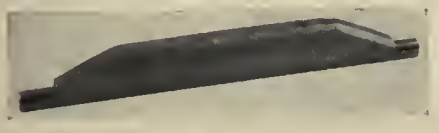



**Construction details of new dasher sign frame**

## Butt-End Trolley Splicing Sleeve

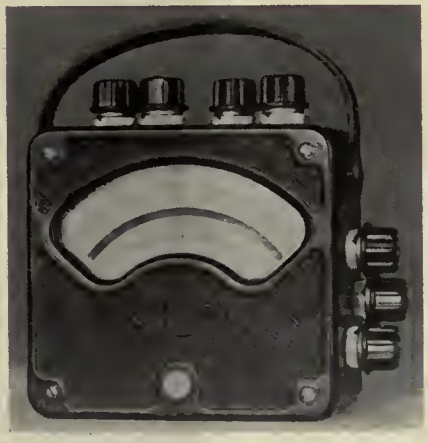
A NEW design of butt-end splicing sleeve for trolley wires, introduced by the General Electric Company, is so constructed that no portion of the sleeve extends below the groove of the trolley wire. The wire is attached in the sleeve by special screws inserted in shallow holes near the ends of the wire. The sleeve is said to be the lightest of equivalent strength on the market and the only one which gives a straight and smooth surface for the collector. It eliminates the splicing sleeve hard spot and thus insures as good a connection at the splice as at any other place in the overhead.

Two styles of the new splicing sleeve are available. One has a wheel clearance and the other is for a slider collector. The slider collector type in repeated tests has given better than 90 per cent of the ultimate strength of the trolley wire. It has been installed in several electrifications, one of the largest being in the Philadelphia-Wilmington section of the Pennsylvania Railroad.



**Butt-end splicer for grooved trolley wire**

## Portable Instruments for Railway Testing



**General purpose meter for railway testing**

RAILWAY maintenance demands dependable instruments of lasting and reliable calibration and certain electrical properties necessary for testing. Among late developments by the Westinghouse Electric & Manufacturing Company are the Coded Current Meter and the General Purpose Meter, type PX-4, which are especially adapted to automatic train control testing. The Coded Current Meter has a twofold application in that it may be used as a standard instrument, as well as one especially designed to measure coded current. The transformation operation is very simple, and readings may be obtained quickly and accurately. The General Purpose Meter is a six-scale volt-ammeter, and takes the place of six instruments with its three voltage ranges and three current ranges. The various scales are accessible through seven insulated terminals and a push button.

## Skeleton Type Helmet Goggles

ACCESSORIES for welding and cutting recently added to the line of the Oxweld Acetylene Company, New York City, are the Oxweld cap and skeleton type helmet goggles. The No. 9 cap type consists of a strong fiber cap to which a pair of goggles is attached by means of fiber links. The goggles can be raised over the forehead or lowered over the eyes with one hand. The bridge is adjustable and is covered with rubber insulation. Replaceable lenses, in the same size and colors as are supplied in Oxweld No. 6 goggles, are used, the colored lenses being protected by cover lenses of clear glass. The No. 10 skeleton type goggles are the same except that the goggles are attached to a lattice skeleton cap. Both styles are provided with leather straps at the rear for head-size adjustment.

The cap and skeleton type goggles furnish adequate protection and are very durable. They have been found by welders who have used them to be extremely comfortable and convenient.



**Goggles are attached to fiber cap by fiber links**



**Light construction is provided by attaching goggles to a skeleton helmet**

# News of the Industry

## Seeks Increase in Fare in La Crosse

The Mississippi Valley Public Service Company, La Crosse, Wis., has petitioned the State Railroad Commission for authority to increase its street car rates, alleging that it is operating under a deficit, and that its earnings for several years have fallen short of a reasonable return by $80,000 to $90,000 annually. In the petition the company asks for a cash fare of 10 cents and a token rate of six tickets for 50 cents, in place of the present 7-cent cash fare and token rate of eight for 50 cents. It further asks to be permitted to establish a five-car, twelve-minute schedule on the south side, 23rd Street line, in place of the present six-car, ten-minute service, and to be allowed to abandon car service on the Badger line from Fourth and Vine Streets to Losey Boulevard.

Constantly increasingly street paving obligations are declared by the company to be the greatest single factor necessitating the relief sought. Under the 1929 city program for construction, the company will be subjected to an outlay of about $91,000, of which, it estimates, almost half will be used in paving streets, the remainder in reconstruction of tracks. Such expenditures, it says, will not increase but diminish its revenues, by reason of the greater use of automobiles upon the improved streets, and will increase the investment of the petitioner upon which it will be entitled to a reasonable return.

## Renewed Service on Lincoln Interurban Under Consideration

Restoration of passenger service on the Omaha, Lincoln & Beatrice Interurban, Lincoln, Neb., abandoned six months ago by permission of the State Railway Commission, is contemplated by the new owners with George P. Abel, wealthy paving contractor, at their head. Morris Freshman, vice-president and general manager of the company, which has been confining its activities to operating only the freight service on an East Lincoln belt line, says, that if the company is permitted to make certain changes in trackage, it will resume hourly passenger runs. Petitions from 700 residents of the suburbs of University Place and Bethany have been filed with the Council, asking that passenger service be restored. The Lincoln Traction Company has been running buses into part of the sections formerly served by the interurban, but this has not proved satisfactory to those located farthest from its route. The commission and the City Council have promised favorable action.

Abandonment was permitted because there was no money available for replacements and the state could not compel continued operation at a loss. The new owners purchased the stock from the Robinson and Musser interests of Akron, Ohio, to prevent the loss of freight service to industries they owned on its side tracks, and canvasses of the situation have induced them to resume passenger service. New equipment of cars of the double-end type with cross seats will be ordered, the track entirely reballasted outside the paved section, new concrete loading stations erected at needed points and wooden bridges replaced by permanent concrete construction. Direct service instead of shuttle cars will be run to University Place.

## Unification Suggested for St. Louis

### Preliminary report of engineers recommends to the transportation survey commission that a single company operate all the local transportation facilities under a terminable permit

COMPLETE unification of the city's transit facilities, and their operation by a single company under a terminable permit, was the outstanding recommendation made by Kelker, De Leuw & Company, Chicago, consulting engineers for the transportation survey commission at St. Louis, Mo., in their first report to that body.

The recommendations are similar to those advocated by Mayor Victor J. Miller some two years ago, and it is believed certain that the present city administration will support the program advanced.

The report was submitted by Rudolph F. Kelker, Jr. Pending final action on the report, the commission, at a meeting on Dec. 21, authorized modifications in a bill to be presented to the Missouri General Assembly next month, which would enable the city to proceed legally with its plans for a city-wide rapid transit system. The changes in the measure were of a minor nature, but were urged by Mr. Kelker as essential to obtaining quick action by the state lawmakers.

If Mr. Kelker's recommendations are carried out fully, it will mean that one company, probably the St. Louis Public Service Company, will acquire all existing transportation facilities including street cars, bus lines and service car routes. The same principle would be followed when and if the city builds subways or elevated rapid transit lines.

The advantages of unification pointed out by Mr. Kelker are: Elimination of needless duplication of service; lowest fares; best service; improvement of traffic conditions; reduction of operating expenses, especially in overhead; and provisions for adequate service in all parts of the city.

Mr. Kelker also advocates that the city have the right and power to purchase the property of the utility and terminate the permit granted it. He told the commission that a part of the income of the transportation company should go into a municipal fund, which in time would prove sufficient to purchase the transit property.

At present St. Louis transit facilities are on a competitive basis. The St. Louis Public Service Company operates all of the electric car lines in St. Louis and St. Louis County and also through its bus auxiliary, the St. Louis Bus Company, has a number of feeder bus lines, while the People's Motor Bus Company, a competitor, has a comprehensive city-wide bus system.

In addition, hundreds of independently owned service cars take business that should go to the street cars or

### "Permanent Parkers"

STUDENTS of traffic problems in all the large cities are beginning to discover that one of the most difficult of its phases for which they seek the solution is that of the "permanent parker," the driver who leaves his automobile on the public highway all day long instead of taking it to a garage. He is the individual against which legitimate complaint is made. If he could be eliminated, there would be fewer demands for rigid parking restrictions.

Automobile owners undoubtedly suffer a hardship, when they are compelled to come into the congested urban centers, by their inability to find a place to park during short business stops. No city, however, has as yet possessed a sufficient traffic force or found the way to discriminate between the permanent and the temporary parker. The one is a nuisance for whom there is no real defense. The other is entitled to a reasonable freedom in the use of the streets of which he is part owner. The survey that can find a way out of this difficulty will win the gratitude of all motordom.—*Philadelphia Ledger.*

buses. The city recently adopted a very rigid ordinance for the regulation of the service car lines, and it is believed that in a very short time they will cease to be a serious factor.

While Mayor Victor J. Miller and other city officials are openly in favor of a single transportation system, residents of some of the outlying districts, notably Lindenwood, Walnut Park, and the Holly Hills section are well satisfied with the present arrangement, under which service is competitive. They believe they have benefited. In view of this situation, it may require considerable work to educate thousands in St. Louis to advantage of single control of a complete transportation system.

A few years ago the interests that reorganized the St. Louis railway system endeavored to purchase the People's Motor Bus Company, but the deal fell through because of failure to agree on the price. Later the auxiliary bus company, the St. Louis Bus Company, began operations as a subsidiary of the railway.

## Service Changes in Milwaukee Under Consideration

Extension of the Sherman Boulevard bus line to Keefe Avenue and the issuance of transfers from street cars to the Green Bay Avenue bus lines will be taken under consideration by the Milwaukee Electric Railway & Light Company, Milwaukee, Wis. Officials of the company state there is no way they can make the change and operate at the present fare, since Sherman Boulevard buses are operating beyond the line where a reasonable profit is returned on the 10-cent fare. The Green Bay Avenue line is operating at a loss.

## Another County Heard from on Traffic

Considerable opposition is being aroused to any plans to reroute the street cars in Indianapolis, Ind., off Washington Street, the main business street, to eliminate traffic congestion. One patron in a letter addressed to one of the newspapers said:

In a recent issue of a national magazine, it was shown by actual counts made in numerous cities that the street railway passenger occupies only 6 sq.ft. of street space as compared to 44 sq.ft. for the auto rider; that the street car occupies only 2 per cent of the street space, yet carries 75 per cent of street users; that the larger the city, the more vital the necessity for the efficient use of street space. It also was shown that more than 91 per cent of downtown shoppers use the street car.

I imagine our merchants will be delighted with a plan to inconvenience 91 per cent of their customers in order to convenience 9 per cent. To a mere citizen it would appear that any plan of traffic control should give first consideration to the most efficient user of the street space, the street car.

## Proposal Before Seattle Council

"Parents don't raise sickly children to health and then let them be adopted by others. So it is with our railway system." This graphic comparison, voiced by Councilman Philip Tindall, seems to represent the sentiment of the City Council of Seattle, Wash., toward the proposal that the municipal railway be leased to a private company for 50 years at a one-fourth "cut" of the line's possible profits. The Council now is considering this proposal and two others pertaining to the taxicab situation, as it touches on the trolley question, realizing that it must soon decide on some method of taxi regulation and railway retrenchment so both may prosper.

Karl H. Kaye wants to lease the railway for 50 years in return for an exclusive franchise for taxi operation within the city. This would bar all other taxi companies. E. W. Taggart of the Red Top Company, wants a similar exclusive franchise for 40 years, but without the risk of operating the trolley system, and promises to pay the city 2 per cent of his gross earnings for the concession.

This is countered by a new proposal from Frank Waterhouse, owner of the Yellow Cab Company, George Colman, owner of the Royal Blue Cab Company, and some ten other cab operators, who ask the issuance of certificates of necessity to all the cab companies now in operation. This would ban the expansion of the present operators, or the entrance of new companies into the city, until such time as the Council believes additional cabs are needed. The cab men also want a return to a straight meter basis with extra fares for additional passengers, and the right for any cab to park in any taxi stand along the streets. They also agree to pay the 2 per cent. They say that a return to meter fares would benefit the city's rail revenues by an aditional $100,000 annually, but at the City Hall it was said the change to zone rates saw no big change in receipts.

## 1,918,805,044 Passengers in Portland Without a Fatality

WHILE the nation celebrates "Safety Week," Portland has a man who has done more, perhaps, than any other to make public safety a national crusade. Credit for the slogan that has saved lives, "Safety First," is often given to Benjamin F. Boynton of this city. "Think," a trenchant suggestion to the heedless, is his. He has worked tirelessly and widely to develop the bump of caution. One of his rewards is the record of the company for which he works. The Portland Electric Power Company since Jan. 1, 1907, has carried 1,918,805,044 passengers and none has been killed.—*Oregon Daily Journal of Portland.*

Whatever plan is adopted by the Council, it is almost certain that the railway will not go again into private ownership. Mr. Tindall favors the granting of certificates of necessity, to prevent the demoralization of the taxicab industry in Seattle, but favors the zone system of fares with the right to charge for extra passengers.

## Santa Claus Becomes Motorman in San Francisco

Santa Claus recently accepted an invitation to become a motorman for the Municipal Street Railway, San Francisco, Cal. He gave the children of the poor free rides to Christmas parties, feasts and entertainments.

## Bringing the Force Together in Baltimore

The United Railways & Electric Company, Baltimore, has leased six entire floors in the new Court Square Building and about March 1 will move its offices from the Continental Building, where its offices are scattered over a number of floors.

## Big Transit Developments Proposed for Cleveland

An open scramble for subway franchise rights in Cleveland, Ohio, developed recently when it became known that a $100,000,000 system of street railways, rapid transit and subways had been projected by the Cleveland Railway and Van Sweringen interests. The method of representation in the management has not yet been worked out, but it is understood that the Van Sweringens have considered the purchase of the Cleveland Railway.

The announcement of the proposal drew from Raymond Cragin, promotor of the Cleveland Subway Company, a statement charging that his offer to build subways worth $30,000,000, to be operated by the Cleveland Railway and paid for from street car fares, had been shelved by the railway. Mr. Cragin declared he had back of him certain groups "who believe it inadvisable to place temporary control of the city lines in the hands of those who permanently own suburban lines."

M. F. Bramley, president of the Cuyahoga Subway Company, has completed the circulation of petitions for an initiated ordinance granting his company the right to construct and operate subways, but has delayed filing the petitions with the City Council. A new company known as the Union Subway Company is advertising for persons to circulate initiated ordinance petitions.

## Taxi Regulation for Cincinnati

Cincinnati's City Council has extended the present taxicab ordinance for two months, forbidding issuance of licenses in the meantime, to permit consideration of a new ordinance making cabs public utilities.

## From Criminals to Street Cars

Every day since New York's new police commissioner, Grover A. Whalen, has been in office, the newspapers have carried columns on his plans for the pursuit of the criminal. But the new commissioner's activity in catching criminals does not cause him to overlook other opportunities for making good newspaper "copy." In discussing the traffic situation on Dec. 28, the commissioner said:

I have a theory that the city is almighty and all-powerful. If we decide the surface cars must go, we will find a way to force them to go.

The street car companies talk and will continue to talk of "vested rights." Well, as far as I can see, their "vested right" now consists of the privilege of continuing to do business at a loss. Their own books show that, in many cases.

Twelve years ago the railways were offered the privilege of converting their surface lines into bus lines, their street car franchises into bus franchises. They couldn't see it. Now they are willing to make the change if the city will pay all the expense.

Then there is no doubt in my mind that the parking privilege is being abused. There must be some way we can work out a compromise with the merchants, a method which would permit women to shop by motor and still eliminate the nuisance parking that selfishly blocks the streets.

Planning for the future is slow work and we cannot expect much relief from new facilities for several years. But there must be a lot of things that we can do immediately with a little intelligent study.

In addition to taking up space in the middle of the city's most important thoroughfares, he points out, trolleys take up space in safety zones at intersections.

One of the first moves, when the results of the police traffic survey are in Mr. Whalen's hands, will be to call a conference with the merchants. He favors the handling of certain types of merchandise at night.

## St. Louis Wage Argument Finished

Final arguments were submitted before the Missouri Public Service Commission, on Dec. 21 and 22, on the wage demands of the carmen and shopworkers of the St. Louis Public Service Company, St. Louis, Mo. The union men have requested higher wages and better working conditions. A counterproposal of the company was for reduced wages.

Lloyd Landau, special counsel for the company, said that last May when a strike of the street car men threatened, Mayor Victor J. Miller called both sides into a conference at which it was agreed the dispute should be submitted for arbitration by the state board with the city acting as an interested party in behalf of the car riders. The city, however, has merely acted as an observer, submitting no evidence and no briefs.

Contending that the company had been brought into the arbitration by the city and then left to its own devices in presenting the case, Mr. Landau called upon Forrest Ferris, Jr., an associate city counselor, who was present, for an explanation of the city's stand. Mr. Ferris replied the city had bound itself to abide by any wage grant the commission might make, but had not bound itself to approve any increase in fares as a result of such wage awards.

## Film Features 1929 Tokyo World Congress

A film, designed to arouse the interest of engineers in the World Engineering Congress to be held in Tokyo, Japan, in 1929, was shown for the first time before a group of engineers in New York on Dec. 18. The film will be exhibited at meetings of engineering societies in the principal cities of the United States, it is understood.

In addition to the glimpses of Japanese statesmen and engineers associated with the Congress that the film depicts, engineering enterprises in Japan which are to be visited by delegates to the world meeting also are shown. Views of each of the chief cities are included, and special attention is given to the sights in each city of interest to engineers.

## T. E. Mitten Retires from Bank Post

T. E. Mitten will retire as president and chairman of the board of the Mitten Bank and Trust Company. This was announced after nineteen directors, elected at a meeting of stockholders, had selected officers for next year. W. K. Myers, vice-president of Mitten Management, Inc., was elected president of the bank and Dr. A. A. Mitten was named to succeed his father as chairman of the board.

According to the announcement these changes are in accord with Mr. Mitten's plan to withdraw from the active leadership of Mitten managed properties, leaving their direction to the younger members of Mitten Management, Inc.

## 100 Per Cent Operation for Five Consecutive Days in Chicago

A new record in service was made by the Chicago Surface Lines during the week before Christmas when all of the 3,639 passenger cars on the system were in operation for five consecutive days.

In 1926 the system approached 100 per cent operation on several days during the Christmas shopping season and atttained it on one day. Last year 100 per cent operation was accomplished on three days during the shopping season.

In order to keep all the cars in operation for five consecutive days, the most careful organization of shops and carhouse repair crews was necessary. Schedules of overhauling and car repair work were speeded up during the latter part of the summer and early fall so that all equipment might be in the best possible condition. After the shopping season began to demand more service, the number of cars in the shops and in repair bays in the carhouses was decreased daily and the equipment was put out on the street.

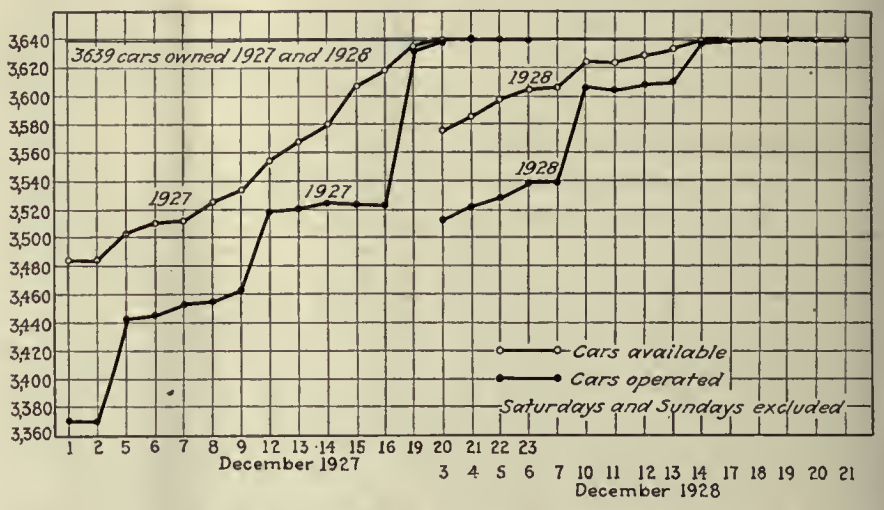



**Chart showing performance of Chicago cars**

On Dec. 17, H. H. Adams, superintendent of shops and equipment, reported that every car was out on the streets and he was able to maintain the equipment so that all of the cars were subject to call for rush hour periods every other day of the week up to and including Dec. 21.

In order to accomplish this, it was necessary to do some quick repair work on a number of cars damaged in traffic accidents. One car in particular, which was badly damaged on Friday, when it was struck by an oil truck, was repaired in record time.

The Chicago Surface Lines also made a new record for riding during the Christmas shopping season. Saturday, Dec. 22, was the biggest day in the history of the company, with 5,296,081 rides, including transfers, and 2,934,442 revenue rides. The riding for the week, in spite of inclement weather during the first days, exceeded that during the similar week last year.

## Experts Favor Car Riders

**Many interesting facts about accidents, parking, etc., revealed by New Orleans survey**

THE IMPORTANCE of street cars as carriers of a large proportion of the population, the small percentage of accidents caused by street cars, the many traffic violations by motorists, the futility of parking laws, and the failure of traffic control to avoid congestion, are among the many features of interest and importance to the street railway industry and the public in the report of experts on traffic conditions in New Orleans just submitted to the City Council.

The study was made by Miller McClintock of the Albert Russell Erskine Bureau of Harvard University, and Harland Bartholomew, St. Louis. It includes a thorough survey of all phases of traffic control, with a proposed remodeled traffic ordinance for the city.

The following provisions of the proposed code relate to street cars:

1. No passing of a street car on the left, except on one way streets or on streets too narrow on the right to make passing possible. Where a safety zone is established, a vehicle need not stop before passing a street car discharging or receiving passengers.
2. Any vehicle on the street car tracks in front of a street car must leave the tracks "as soon as practicable" after signal from the street car. No vehicle shall drive upon or across the car tracks within the intersection in front of a street car, when the car has just started to cross an intersection.
3. No vehicle shall drive over or through a safety zone.
4. No person shall board or alight from a street car or other vehicle in motion.
5. No person shall ride on any part of a street car or other vehicle not intended for passengers, except employees in discharge of duty and those in truck bodies in space intended for merchandise.
6. No steam or street railway train or car shall obstruct the street longer than five minutes. This does not apply to trains or cars in motion unless engaged in switching. No street railway train or car shall stop within an intersection or on a crosswalk to receive or discharge passengers.

Says the report:

New Orleans is fortunate in the possession of so large a number of neutral ground streets, which permit the segregation of street car and vehicular traffic. This separation of right-of-way is of great advantage in street car operation and at the same time permits a greater freedom of movement of vehicles upon street car streets than would be possible otherwise.

Only 1.06 per cent of personal injury accidents are caused by street cars, while private passenger cars cause 69.26 and trucks 18.76 per cent. Bicycles cause 2.88 per cent, motorcycles 2.52, horse vehicles 2.34, taxicabs 2.12, other vehicles 0.47, motor buses 0.28, railroads 0.23, and unknown 0.08.

In data showing the classes of public accidents in New Orleans from 1921 to 1927, it is noted that the total increase from 696 to 1,165 can be attributed to motor vehicles. In the same period, the report states, accidents from street cars have constantly declined from 156 in 1921 to 63 in 1927. To no small extent, says the report, this is due to improved operating and safety conditions.

A traffic engineering division is recommended, with a competent traffic engineer and at least four traffic investigators. A regular parking squad of not less than twelve officers is also recommended. "Of all aspects of traffic control in New Orleans at the present time," the report says, "the enforcement of the parking regulations is by far the most unsatisfactory."

To determine the total concentration of vehicular traffic in the central business district, a count was made on several days from 8 a.m. to 6 p.m. It was found that 66,846 automobiles entered that district in a day and that the average automobile carried only 1.6 persons.

According to the New Orleans Public Service, the average street car carries into this district each day from 8 a.m. to 6 p.m. 37 passengers.

It is shown in the report that the largest number of motor vehicles in the central business district at one time, either parked or in motion, occurs at 4:30 p.m., when approximately 6,200 are there. This peak of accumulation occurs in other large cities studied between 12 noon and 2 p.m. It is, therefore, deduced that in New Orleans there is a larger use of motor cars by persons who leave them within the district the entire day than is to be found in other cities.

# What a Railroad Is Worth

**Another plea made for a definite pronouncement by the Supreme Court of the legal principles which shall govern valuation for rate-making and recapture of excess earnings**

IN FIXING the valuation of a railroad for recapture purposes under the Transportation Act, consideration should be given to all relevant facts and circumstances including the present level of reproduction costs, according to a brief by the St. Louis & O'Fallon Railway and the Manufacturers' Railway, jointly owned, filed on Dec. 14 in the Supreme Court, which has fixed Jan. 2 for hearing arguments in the case. Since certain fundamental questions are involved, the matter is regarded as of widespread interest to all utility corporations.

The case is essentially an appeal from a decision of the Federal District Court for the Eastern District of Missouri, sustaining in most part an order of the Interstate Commerce Commission, in which it was held that the net railway operating income of the O'Fallon railroad for the last ten months of 1920 and the calendar years 1921, 1922 and 1923 exceeded 6 per cent on the value of the property of that carrier and requiring the road, under the recapture provisions of the Transportation Act, to turn over to the commission 50 per cent of the excess which the commission found in each period.

In seeking to have the Supreme Court reverse the decision of the district court, the brief attacks the decision of the lower court on the grounds that the O'Fallon and the Manufacturers' railways, contrary to the finding of the commission, constitute a system of carriers under common control and management, and that the valuation and earnings of both roads should have been taken into consideration instead of the O'Fallon alone. Says the brief:

It appears upon the face of the report that the commission did not determine or undertake to determine the "present value" of the O'Fallon by consideration of all relevant facts and circumstances, but that its so-called findings of value in respect to the O'Fallon were based upon a mathematical formula, the avowed purpose of which was to determine the approximate investment in its property; that the commission refused in such so-called determination of value to give either effective weight or any weight whatsoever to the present cost of construction; that such refusal was not based on any fact or facts found by the commission pertaining to the property of said carrier, but upon the conclusion of the commission that no consideration should be given to present-day prices in determining the value of any railway property for the purpose of either rate making or recapture; that the commission's so-called findings of value are based upon an erroneous conception of the law and of its powers thereunder and are unsupported by and contrary to the evidence; and that the true value of the O'Fallon greatly exceeded the so-called values found.

The brief points out that, under the provisions of the Transportation Act, all net railway operating incomes in excess of one-half of the amount by which such income exceeds 6 per cent of the value of the carriers property remain the absolute property of the carriers and, consequently, the order of the commission, if it takes more, constitutes the taking of the carriers' property without due process of law, and a taking of private property for public use without just compensation.

The carriers charge in the brief that

### Prize Beef

FIFTEEN yearling Hereford steers, averaging 1,060 pounds, were purchased by the Chicago, South Shore & South Bend Railroad to be used in the serving of choice cuts on dining cars during the Christmas season.

The steers, all prize winners, raised by Allen Newland & Son, Hudsonville, Ill., were purchased through Armour & Company. They were prepared for slaughter right after their purchase and appeared in the form of special steaks and roasts on South Shore Line dining car menus.

the Interstate Commerce Commission greatly exaggerates the supposed "unfavorable economic consequences" which might occur were freight rates made on the basis of the true value of the property. The brief continues:

The present rate-making rule is believed to be a salutary rule. It has led to no unfavorable economic consequences in the past. Despite its observations as to what might have been or might be, the commission is obviously of the view that it will lead to no unfavorable economic conditions in the future. If contrary to such expectation, the restraint of self-interest and of the power reserved to the commission in the maintenance of individual reasonable rates should turn out to be inadequate to protect the commerce of the country against exorbitant charges, under the rate-making rule prescribed by Section 15a as it now reads, Congress has full power either to repeal or modify it.

The brief contends that the Interstate Commerce Commission should have determined the value of the O'Fallon railroad in accordance with established law, but instead guessed at the original cost which was actually unknown.

The value of a public utility property, whether it be a railroad or a water plant, may be more or less than the sum of the cost of reproduction, less depreciation, if any, of its several units. Property is not all of the same quality. Consequently, the relevant facts and circumstances vary as to different properties, and no formula can be employed.

The railroads in this case are merely insisting on the same constitutional protection given other utilities, according to the brief, which points out that "on proper analysis it appears that the only difference between the original cost as of 1910, and the reproduction cost as of 1920-3 for the O'Fallon railroad is that the former is expressed in past prices measured in an obsolete dollar, whereas the latter is measured in today's dollar.

The brief says that the public utilities of the country other than railroads, as a result of the decisions of the court, have not been excluded from the operation of this economic law which has affected all of the monetary transactions of the country. The railroads should not be excluded, and cannot be, without actual deprivation of property.

## Transportation Association Committee to Study Equipment

Detailed consideration of the scope of its assignment occupied the attention of the new transportation and traffic committee on "The Equipment," at an organization meeting held at association headquarters in New York on Dec. 6, 1928, with Adrian Hughes, Jr., chairman, presiding. This committee, under the new plan of committee assignments in the transportation and traffic association, includes the work of the former bus committee of that association and, in addition, covers the study of rail equipment from the several angles of interest to transportation men.

It was decided that the committee's work properly embraces the general question of the size, arrangement and character of public transportation vehicles. This year's study will be confined to surface cars and buses for use in cities above 75,000 in population, since another committee has been organized to study the specific transportation problems of the small community.

The work of the committee for the year will be divided into three principal divisions. First of these is a study of the facilities that should be provided on modern car and bus equipment for the comfort and convenience of passengers, to the end that the service may be made as attractive as possible. In this phase of the study, consideration will be given to the relation between the particular class of service in which the vehicle is to be used, and the character of equipment which is desirable and practicable under these conditions. The second division of the committee's subject will deal with the determination of the general size and characteristics of public transportation vehicles most suitable for various classes of service. Both studies will include buses as well as rail equipment, and will develop the matter of equipment size and characteristics in its relation to such service conditions as heavy trunk line service in large cities, cross town and secondary lines, service in moderate sized cities, special combinations of express and local service, de luxe scheduled service, chartered and tour service, etc. Consideration will be given to the possibilities of trackless trolleys.

A third division of the committee's work contemplates the preparation of a report outlining the need for accounting information, that will serve as a guide in transportation management by giving needed data regarding the results of operation of individual lines, both cars and buses. This is a continuation of the work done last year by the bus committee in suggesting a similar arrangement of accounts with respect to bus operation. It is the intention to prepare a tentative outline of the accounting information needed for intelligent transportation planning and management, in the hope that the Accountants' Association may be interested in the need for this classification of operating information not provided by the present classifications of accounts.

In addition to the above program, it was decided to suggest to the American Association that the new committee on car financing undertake to obtain accurate information regarding the actual results achieved with new equipment, in the way of increased revenues and reduced costs, supplementing and bringing up to date similar information previously collected by other committees and agencies. Those present at the meeting included the following: Adrian Hughes, Jr., R. J. Bennett, J. F. Craig, H. H. Dartt, C. F. Kells, E. R. Kelly, T. R. Langan, T. W. Noonan, E. A. Palmer, M. W. Rew, A. Shapiro, E. F. Theisinger, representing C. W. Stocks, J. C. Thirlwall, H. B. Whitman representing A. T. Warner, J. W. Welsh, Charles Gordon, G. C. Hecker, and Samuel Riddle, sponsor.

## Bondholders Object to Chicago Plan

**Representatives of holders of Chicago Railways bonds says proposed financial scheme will not work**

DECLARING that the City Council has been proceeding on the wrong theory in attempting to work out the details of an ordinance before obtaining the necessary enabling legislation from the General Assembly, Albert W. Harris, chairman of the bondholders' protective committee of the Chicago Railways, urges that attention be centered on legislation and that negotiations for an ordinance be delayed until this step is taken.

The proposed ordinance which company and city officials have been discussing for some time, Mr. Harris says, is "essentially a municipal ownership franchise and attempts to fix rates and arrange an income which within 40 years will result in city ownership out of earnings and accumulated interest of various funds. It provides in the interim for a local commission which will practically run the property. Nowhere in the franchise does it agree to buy, and the rates proposed, in my opinion, will not be adequate to meet the requirements called for by the plan." He also said:

It sets up a financial scheme which will not work and under which any company to be formed to take over the properties could not set up a workable financial plan. And, finally, it purports to be a service-at-cost franchise when it is not, because of the extra charges put upon the car rider for the purpose of purchasing the property. In other words, it is a municipal ownership franchise without agreeing to purchase. It proposes a consolidation of surface and elevated lines under an impossible financial scheme and gives to a local commission all the powers of an operating body, and the details of the franchise will not make it possible to carry out the plan, if such it may be called.

Admitting that the details might be changed, such as an agreement for a reasonable return on the capitalization, suitable rates of fare agreed upon from time to time instead of for a fixed term of years, etc., it would not change the fundamentals embraced in the franchise. This is the third attempt to settle the railway matter by taking up the last thing first, viz., the franchise, and illustrates the futility on the part of the transportation committee, who have no authority in law for making the kind of trade they are trying to make, in trying to trade with people who have no authority to trade. Legislation must first be had making it legal to take the action necessary and a company must then be formed with which the city can deal.

There should be only two parties to the kind of trade proposed—a company and the city, both with authority to trade—not three companies and the city, neither with power to act, neither agreeing upon what they want. To carry the above procedure out, the legislation should first be had, next a company should be formed to take over the consolidated properties, and, third, a franchise should be entered into between the city and the new company. This is the plan originally proposed after a great deal of discussion, and the fact that it has not been carried out is the reason why nothing has been accomplished.

## Wanton Destruction of Cars Charged in Rochester

Rochester lines, New York State Railways, has declared war on vandalism in the 12-mile municipally built and railway operated subway at Rochester, N. Y. In a statement asking public co-operation to prevent destruction of property, Charles E. Lewis, superintendent of interurban transportation for the railways, complained that hinges on doors and light bulbs have been broken and stolen, and subway stations generally defaced. He suggested that the public report loiterers about the stations.

The subway, which began operation on Jan. 1, 1928, is located in the bed of the abandoned Erie Canal. High speed locals, interurban and freight lines use the erstwhile "big ditch" of Clinton.

## Newspaper Urges Paving Relief in Grand Rapids

Relief from the burdens imposed by meeting paving requirements is being urged by the Grand Rapids *Press* in the interest of securing a square deal for the Grand Rapids Railroad. The situation as that paper sees it is, perhaps, best described in the exact words of the paper's editorial presentation, in part as follows:

Grand Rapids has been asked to consider its street railway system in the light of the experience of Michigan's destroyed interurbans. The railway system is worth $6,000,000. It is maintained by public spirited men who have passed up dividends year after year in order to put their returns back into tracks and rolling stock for the service of the Grand Rapids public. Its progressiveness and efficiency of operation have been rewarded by presentation of the Coffin medal to Manager DeLamarter. Its economy has brought committees and administrative experts from other centers to study the details of car rebuilding and service policy.

Under a service-at-cost franchise, fares in this city are adjusted to income with an 8 per cent limit on the company's earnings. In the year ending Oct. 31 the actual earnings were 5.95 per cent.

Facing this situation the proposal has been made that the company go over to buses. City Attorney Taggart has asked for an estimate of the effect of such a change upon the city and upon the railway. It is obvious, in the first place, that abandonment of the tracks would at once relieve the company of the cost of paving between them, an expense for which there is no justification. In the second place, its rolling stock would be taxed by the state instead of the city, and Grand Rapids would lose the income. That is, gasoline and license taxes for state highway maintenance would be substituted for city taxes; and at present only a trifling part of the motor vehicle taxes paid by a city comes back to it. Finally, in place of the fixed street car with its minimum effect on traffic congestion, we should have a fleet of heavy buses increasing street hazards, swinging in to curbs for passengers, and wearing out brick and concrete instead of company rails.

Consulting Engineer Wagner estimates that had the company been operating a bus system last year it could have saved $50,541 in taxes, using as a basis a fleet of 202 buses and including state license and gasoline taxes. Mr. Wagner's conviction is that such a change is inevitable, unless the city meets the situation by relieving the company of part of its expense.

There is no reason why, as soon as the necessary charter steps can be taken, Grand Rapids should not free the company from the paving charge. That step would be an economy, not a loss, in the long run, entirely aside from the inequity of charging motor traffic highways against rail traffic which never touches them.

## Original Ideas in Wisconsin on the Use of Old Cars

When buses and one-man cars replaced the old equipment of the Wisconsin Public Service Corporation at Green Bay, Wis., ten old cars were dismounted and the bodies sold. But such replacement did not spell the end of the cars. For driving into the city on Highway 141, one comes upon an old interurban car which has been transformed into the "Trolley Barbecue." In one end of the car alternate seats were removed to make room for tables, giving the place four tables seating four persons each. The other end of the car has a counter running lengthwise. The vestibule beyond is occupied by a large brick barbecue fireplace equipped with an electric turnspit.



So-called "Trolley Barbecue" on Highway 141

On the Sturgeon Bay road, one of the old cars has been set up on stilts at the rear of a roadhouse, to be used as a restaurant. The Bay road leads to another old car, disguised almost beyond recognition. Wide porches have been built at either side and around the front end which faces the bay. The seats have been removed from the car and arranged around the porches. The whole "cottage" has been painted white.

The Wisconsin Public Service Corporation began in 1921 to change to Birney cars. The first one was put in service that year and by 1924 the old cars had been practically replaced. Buses went on the interurban run. The Green Bay carhouse had seventeen old cars. Five of them were dismantled, but the bodies of the others were sold, bringing from $50 to $100 apiece.

## Paving Matter Discussed in Lynchburg

Negotiations are under way between officials of the Lynchburg Traction & Light Company, Lynchburg, Va., and City Manager R. W. B. Hart, looking to a compromise on the franchise stipulations in regard to the paving of track areas in certain streets.

A previous proposal of the City Manager, which called for payment by the railway of $8,500 to the city for a period of fourteen years, was frowned upon by the company officials, and as yet no agreement has been reached.

According to Mr. Hart, the company has submitted to him a tentative draft of certain proposals, and he said he would have to go over and revise this draft and resubmit it to the company again.

## Excursion to See South Side of Chicago

In an effort to acquaint more residents of Chicago with the electrified suburban train service that is being furnished the south side of the city, the Illinois Central Railroad recently offered a special 25-cent round trip fare between any two points on its Matteson, Blue Island and South Chicago suburban divisions. The special excursion tickets were good on Sunday only—the date of issue—between certain hours of the morning and certain hours of the afternoon. "Stop-Overs" were allowed at any point en route.

This was the first excursion of the kind ever conducted by the Illinois Central on its Chicago suburban lines.



Car flanked with wide porch for use as summer cottage

## Holiday Services for Students on Southern Pacific Routes

The Southern Pacific Company put on its special service on the Red Electric line for holiday students from Oregon State College, the University of Oregon, and the Oregon Normal School. It also offered accommodation to a number of smaller private schools down the Willamette Valley.

## New Fare Arrangement in Decatur

Tentative agreement between the city of Decatur, Ill., and the Illinois Power & Light Corporation, subject to approval of officials of the latter company, has been reached, providing for lower tariffs when large blocks of tickets are purchased.

The City Council protested the recent fare increase, attempted to reopen the case before the commission and agreed to accept the conciliatory efforts of the Association of Commerce. A 10-cent basic fare and the three-for-a-quarter ticket plan are retained, but seven tickets are available for 50 cents and fifteen for $1 with twenty school tickets in a book for $1.

## Safety Rewards in Jacksonville

Turkeys and hams were presented to operators and conductors of the Jacksonville Traction Company, Jacksonville, Fla., who aided in the operation of cars without chargeable accidents. The contest, which lasted 80 working days, closed on Dec. 15. Winners included 89 operators and eleven conductors. In addition, eighteen other men operated without chargeable accidents, but had not worked the number of days required for recognition.

## Settlement of Construction Work in Lebanon

Several injunction proceedings instituted by Lebanon, Pa., against the Lancaster, Ephrata & Lebanon Street Railway in the Court of Common Pleas of Lebanon County, to compel relaying of tracks to paving grade, and repaving by the company of six blocks on Walnut Street in Lebanon, were decided adversely to the city by the lower court. The decision was upon the ground that there had not been a formal and lawful establishment of the new grade.

The city thereupon went before the Supreme Court, where the appeals were pending until recently. In the meantime the officials of the railway and the Councilmen of the city entered into amicable conferences and determined upon a program of co-operation. The railway furnished its men for grading and lowering of tracks, and the city furnished the stone and the oil.

The outcome was so satisfactory to the city officials that the appeals which were made to the Supreme Court have been discontinued.

## COMING MEETINGS OF *Electric Railway and Allied Associations*

***Jan. 4, 1929*—Metropolitan Section, American Electric Railway Association, 33 W. 39th St., New York, N.Y.**

***Jan. 14-18*—American Road Builders' Association, convention and road show, Cleveland, Ohio.**

***Jan. 15-16*—Kentucky Association of Public Utilities, annual meeting, Brown Hotel, Louisville, Ky.**

***Jan. 22*—New York Electric Railway Association, mid-winter meeting and dinner, Hotel Commodore, New York, N. Y.**

***Jan. 23-25*—Electric Railway Association of Equipment Men, Southern Properties, and Southwestern Public Service Association, Mechanical Division, joint meeting, Houston, Tex.**

***Jan. 24-25*—Central Electric Railway Association, Claypool Hotel, Indianapolis, Ind.**

***Jan. 25-26*—Central Electric Railway Accountants' Association, Claypool Hotel, Indianapolis, Ind.**

***Jan. 28-Feb. 1*—American Institute of Electrical Engineers, annual convention, 33 W. 39th St., New York, N. Y.**

***Feb. 7-8*—Midwest Electric Railway Association, Midwinter meeting, Robideaux Hotel, St. Joseph, Mo.**

***Feb. 14*—Central Electric Railway Master Mechanics' Association, Youngstown, Ohio.**

***Sept. 28-Oct. 4*—American Electric Railway Association, 48th annual convention and exhibit, New Public Auditorium, Atlantic City, N. J.**

## New Association Members

MEMBERSHIP in the American Electric Railway Association was voted by the executive committee at its meeting held in New York on Nov. 25 to four manufacturer companies, one associate and fourteen individuals. New company members are:

ASSOCIATE

Jackson & Moreland, consulting engineers, Boston, Mass.

MANUFACTURER COMPANIES

Anderson Body Company, Sidney, Ohio.
Cleveland Graphite Bronze Company, Cleveland, Ohio.
Highway Service, Inc., New Bedford, Mass.
United States Nito Company, Inc., Columbus, Ohio.

## Hearing on Wage Increase for Indianapolis Men Set

First hearing on the petition of employees of the Indianapolis Street Railway, Indianapolis, Ind., for a 15-cent increase in pay has been set for Jan. 10, according to an announcement by Frank Baker, attorney for the Amalgamated Association. The hearing will be held before Howell Ellis, a member of the Indiana Public Service Commission. Mr. Baker said the Indianapolis pay schedule of 40 and 45 cents an hour was below that of any other city of similar size in the United States and Canada.

## Higher Fare Sought for Green Line

Officials of northern Kentucky communities utilizing the Green Line of the Cincinnati, Newport & Covington Railway Company heard a plea on Dec. 14, made by H. C. Blackwell, president of the Green Line, for increased fares. Mr. Blackwell told his audience the Green Line is losing money. He said its physical value is about $8,000,000 and its earning capacity should be $1,200,000 a year. But instead the Green Line is showing a net annual earning of only $299,000. This leaves it about $900,000 a year short of an adequate return.

Mr. Blackwell had first broached the topic at a dinner he tendered officials in Cincinnati some months ago. On Nov. 16 the Covington commissioners heard it, and at the latest gathering the speaker expressed willingness to meet the officials in each of the communities, but would prefer to negotiate with a committee of business men representing all the towns and cities.

His idea of a satisfactory fare is one similar to that in force in Cincinnati, which is three tickets for 25 cents or 10 cents cash for a single fare. He observed that the average carfare all over the country at present is 8.2 cents, while Green Line riders pay a nickel. In summing up his position President Blackwell said that the present 5-cent fare could not continue, that the company was not earning even expenses and that bridge tolls and terminal charges brought the fare on the line down to 4½ cents.

He seeks a franchise running twenty years and calling for a higher fare, in place of the present perpetual franchise which fixes the fare at 5 cents.

## More Free Ride Privileges in Detroit

Free rides have been voted by the Street Railway Commission of Detroit, Mich., to all employees of the department, totalling 7,500. Heretofore only platform workers in uniform have been permitted to ride without charge. A system of identification for all non-uniform employees will be worked out by the Department of Street Railways, it was decided.

# Recent Bus Developments

## Substitutions in Connecticut

Permission was granted to the Connecticut Company to discontinue railway service between Winsted and Torrington, Conn., and between Thomaston and Fort Sill, Waterbury, Conn. The service will cease on Jan. 5 and will be succeeded on Jan. 6 by bus service by the New England Transportation Company. The latter company will operate a through bus service from New Haven to Winsted via Waterbury, Thomaston and Torrington. At the same time the Connecticut Company was authorized to replace railway service in Portland and between Portland and Middletown, Conn., a route which crosses the Connecticut River, with bus service. Service on this route will be changed on Jan. 13.

## Blanket Permit Sought in Berkshire County

Through Clinton Q. Richmond, general manager of the company, the Berkshire Street Railway has presented a petition asking for permission to operate buses on any or all of its trolley routes operating throughout Berkshire County in western Massachusetts. The blanket permit would be subject to the approval of the Public Utilities Commission on each subsequent bus line before operations could be started.

## Petersburg Company Seeks Agreement With Railway

Officials of the Southside Transportation Company, which is under new management, plan to increase the service of the company and will apply to the Petersburg City Council for universal transfer service and an increased fare. It will ask for a 7-cent fare and the universal transfer, which will be acceptable on all of the lines, buses and street cars operated in Petersburg by the Virginia Electric & Power Company.

## Illinois Properties Cannot Be Sold

Rehearing of a petition to sell its subsidiary motor coach properties, known as the Alton Transportation Company, to the Chicago & Joliet Electric Railway and the Illinois Power & Light Corporation was denied to the Chicago & Alton Railroad on Dec. 18 in an order entered by the Illinois Commerce Commission. At the same time, the commission annulled the certificate previously granted the Alton Transportation Company for the transportation of passengers between East St. Louis and Chicago over state highway No. 4 and awarded the permit to the Tri-State Bus Company, Springfield, Ill.

## Opportunity for Development Given to Pacific Electric

In a divided opinion, Commissioner William J. Carr dissenting, the California Railroad Commission denied on Dec. 17, the application of T. C. Gillespie to operate auto stage service locally between Hollywood and Ocean Park. He was granted permission to reroute his buses.

In the same opinion the commission ordered the Pacific Electric Railway, protestant against the application, to submit to the commission, after conferring with the parties appearing in the present proceeding, a plan to experiment adequately with the operation of bus service to meet the situation developed in the present proceeding. The commission took this action because of its belief that the Pacific Electric Railway, which at present occupies the field with its railway service, has striven to furnish an adequate service, and at reasonable rates, and if there is a demand for bus operation between the points involved in the present operation, the Pacific Electric Railway should be given an opportunity to supply that service, or to experiment toward such development.

Commissioner Carr in his dissenting opinion agrees with the conclusion that, under the record in the proceeding, the commission cannot refuse the Hollywood-Santa Monica section some relief in the way of addition or improved transportation. He held that natural sympathy for the Pacific Electric, in its struggle to make its passenger business pay, should not lead to the establishment of a new principle or rule, which places existing utilities in a highly entrenched position and correspondingly discourages all new utility enterprises. He is of the opinion that Mr. Gillespie should be permitted to render a service recognized as necessary.

The majority opinion points out that the Pacific Electric Railway has made experiments in the development of bus transportation and also in the matter of revising its rates, with the view to developing additional traffic and additional revenue, such efforts being made under the direction and with the approval of the commission.

The commission concluded as follows:

> The record before us shows that the passenger operations of the protestant's railway on the whole are conducted upon a very narrow margin of profit. If a substantial amount of business is diverted by a policy of unrestricted competition from bus lines, added to the competition of private automobiles, its revenues very probably would be reduced to a point where virtual abandonment might be necessary.

## Crude Oil Used Successfully in Philadelphia

ALTHOUGH some of the best chemists and analysts have insisted that crude oil cannot be used as fuel for buses, the Philadelphia Rapid Transit Company is now operating twenty buses with crude oil. That means a saving of $50 per bus per month, and as the system will soon be operating 1,000 buses, a substantial saving will be made for the company. An apparatus has also been developed to analyze and test the bus exhaust gases, making it possible to reduce the percentage of carbon monoxide to between 1 per cent and 3 per cent, whereas the average for all motors is 5 per cent to 9 per cent. Not only will this safeguard the health of bus riders, but if this method could be applied to all motors, the tragic deaths from this source would be greatly reduced.—*Service Talks.*

## Would Abandon in Hudson and Greenport

The Eastern New York Transportation Corporation, Rensselaer, N. Y., has applied to the Public Service Commission for permission to abandon its existing bus service in Hudson and Greenport, alleging that the income from operation has not been sufficient to pay the operating costs. It states that the total operating revenue in 1927 was $18,650 and the total expenses $25,786, while from January to November inclusive, in 1928, the income was $24,314 and the expenses $31,596.

In the petition it states that it has conformed to various local requests with reference to the bus service, but that it has been unable to continue operations without obtaining advances of contributions from the Eastern New York Utilities Corporation to make up bus deficits. Conferences have been held with the local authorities in relation to a change in the local franchise under which the company operates, but no action has been taken by the Hudson Common Council committee toward relief in the form of a 10-cent cash fare, thirteen tickets for $1. The company does not believe there would be much relief under the 10-cent fare proposed.

## St. Louis Agrees With Company Request

City Counselor Muench of St. Louis, Mo., recently filed a brief with the Missouri Public Service Commission, in which the city joins the St. Louis Public Service Company's request for the abandonment of its Vandeventer Avenue car line between Market Street and Natural Bridge Avenue, provided that adequate bus service is substituted. The city holds the state commission has authority to impose a condition that buses be supplied for patrons if the line is to be abandoned.

# Financial and Corporate

## $47,000 Improvement in Toledo in November

Revenue of the Community Traction Company, Toledo, Ohio, was $316,389 for November, a gain of $43,260 over the corresponding month of last year, reflecting better industrial conditions and active business in the community. Passenger revenue on the street cars was $235,665 and total revenue $248,838. This left an income of $53,637 for railway cars after $181,436 operating expenses and $13,763 taxes.

Coach revenue was $65,944 and net income $9,323, the best showing since buses have been operated by the company. Bus deliveries are being hurried in an effort to bring the coach capacity of the company up to size sufficient to make possible the establishment of the new Franklin Avenue line which will replace the Bancroft Belt line, to be abandoned.

After heavy maintenance charges there was a net surplus of $2,355 for the stabilizing fund compared with a deficit of $44,765 for the corrresponding month a year ago.

Cars and coaches carried 4,211,404 passengers. This was an increase of 500,000. Service was increased and operating expenses rose, due to larger proportion of motor coach service.

The influenza epidemic hit Toledo in the midst of the Christmas shopping period and cut into railway revenues in early December at a rate of $1,000 a day. At one time, as many as 150 employees of the company were on leave due to sickness.

## $3 Basis in Cincinnati

The Cincinnati Street Railway, Cincinnati, Ohio, has placed its $50 par capital stock on a $3 annual dividend basis against $2.50, previously paid. The company declared a dividend for October at the former annual rate of 5 per cent and for November and December at the new rate of 6 per cent, payable Jan. 1, to stock of record Dec. 24.

## More Valuable Rights for Montreal Holders

Following a meeting of the board of Montreal Tramways, Montreal, Que., it was announced the company will issue 10,000 additional shares of capital stock of $100 par value, and will offer them at $150 per share to holders of existing stock of record Dec. 21, in the proportion of one share for every six shares held.

The issue of 10,000 shares will bring the outstanding stock of the company up to $7,000,000 and is the third issue of $1,000,000 of stock in the past two years. The treasury will receive $1,500,000 in cash as a result of the financing.

At their meeting the directors also declared the regular quarterly dividend of $2.50 per share on the capital stock.

## 3,000,000 More Ride on Chicago Surface Lines Than a Year Ago

Riding on the Chicago Surface Lines has continued to increase and November shows a total increase over a similar month last year of 3,032,039 rides. The 134,285,240 rides, including transfers, exceeded the previous high November riding, 1926, by 2,933,370 rides. Revenue rides were 74,402,575, an increase of 723,876 over November, 1926, and of 1,041,735 over November last year.

Gross receipts during the month were $5,137,094, an increase over 1926, the previous high November, of $50,627.

## Expansion by Georgia Power

Two utilities in Augusta, Ga., were recently taken over by the Georgia Power Company and will be operated as an integral part of that system. They are properties of the Augusta-Aiken Railway & Electric Corporation and the Georgia-Carolina Electric Company. With the announcement of the acquisition, it was stated that F. B. Culley, vice-president and general manager of the Augusta-Aiken Company, will continue in charge with the title of division manager of the newly created Augusta division of the Georgia Power Company. The utilities involved in the new expansion of the Georgia Power supply, besides electric light and power, railway service in Augusta.

This purchase followed close upon that of the Macon Railway & Light Company, Macon.

P. S. Arkwright, president of the Georgia Power Company, said that the closer alliance now effective between the Georgia Power Company and the Augusta utilities should prove of great advantage to both companies.

# New York Traffic Figures Released

### For fiscal year ended in June 2,921,200,000 passengers rode rapid transit and street surface lines. Bus and tube traffic swell total to 3,235,200,000

PASSENGERS numbering 3,235,200,000 were carried on the rapid transit lines, the Hudson tubes, the street surface lines and the bus lines during the fiscal year ended June 30, 1928. Rapid transit and street surface lines in New York City carried 76,700,000 more passengers during the fiscal year ended June 30, 1928, than they carried during the preceding fiscal year. Total number of passengers carried on the rapid transit and street surface lines in New York City for the fiscal year just ended was 2,921,200,000. The increase in percentage was 2.7 per cent over the preceding fiscal year. In addition, the Hudson & Manhattan Railroad carried 112,500,000 passengers, and the bus companies reporting to the Transit Commission carried 86,100,000.

It is estimated that the traffic carried by the municipal bus lines during the fiscal year reached a total of 97,750,000. The Williamsburg Bridge local line carried 17,600,000 passengers. These figures when added give a grand total of 3,235,200,000.

Below is a table showing the percentage of this total carried by the various lines:

| | Per Cent of Total Traffic |
|---|---|
| Interborough Rapid Transit Company | |
| Subway division | 27.75 |
| Elevated division | 10.85 |
| Total, Interborough Rapid Transit Company | 38.60 |
| New York Rapid Transit Corporation (Brooklyn-Manhattan Transit) | 20.70 |
| Total, rapid transit lines | 59.30 |
| Street surface lines | 31.54 |
| Hudson & Manhattan Railroad | 3.48 |
| Bus lines (exclusive of municipal bus lines) | 2.66 |
| Municipal bus lines (estimated) | 3.02 |
| Total | 100.00 |

## Metropolitan Acquisition in Boston

A BILL has been filed in the Massachusetts Legislature for the incorporation of the Metropolitan Transit Company with authority to take over the various transportation lines within the Metropolitan area of Boston. The lines which it is sought to consolidate, under the provisions of this bill, are the Boston Elevated, some of the old Boston & Northern, the Newton Circuit of the Boston & Albany Railroad, and the Boston, Revere Beach & Lynn Railway, recently electrified. Sections of other lines are wanted. A part of the Eastern Massachusetts Street Railway is located in the district.

In the matter of financing it is proposed to create 7,500,000 shares of capital stock of a par value of $10; of this 2,500,000 shares are to be set aside for extensions and improvements; bonds up to $125,000,000 would be authorized.

Appearing as petitioners for this legislation are William J. McDonald, A. H. Kenyon and Elbridge R. Anderson.

The Interborough Rapid Transit station at Times Square is still the busiest station in the city. A total of 55,093,646 fares were collected there during the last fiscal year, an inerease of 6,970,080 over the previous year. Grand Central is the next busiest station. For the fiscal year 1928, 44,371,196 fares were collected at that station, an increase of 4,164,868 over the previous year. The Pennsylvania station of the Interborough stands third on the list with 41,885,547 fares collected, an increase of 3,911,292. The fourth largest station is the Brooklyn-Manhattan Transit station at Times Square, at which 34,630,250 fares were collected for the 1928 fiscal year, an increase of 1,782,250 over the previous year.

The accompanying table shows the ten largest stations on the Interborough and Brooklyn-Manhattan lines with a comparison of the 1928 and 1927 figures.

Four of the stations on the Brooklyn-Manhattan Transit lines show a decrease when compared with the figures of 1927. The explanation offered is that the 1927 figures were slightly abnormal because of the strike on the Interborough lines during July, 1926, which resulted in a shift of passengers to the Brooklyn-Manhattan lines. Thus, if these stations on the B.M.-T. had had only their normal increase for the fiscal year 1927, the figures for 1928 would probably not show a decrease.

The maximum traffic days for the fiscal years ended June 30, 1928, and 1927, on the I.R.T. subway and elevated lines and on the B.-M.T. lines were:

| | Fiscal Year Ended June 30 1928 | 1927 |
|---|---|---|
| I. R. T. Subway Division | | |
| Dec. 19 | 3,113,346 | |
| Feb. 21 | | 2,861,217 |
| I.R.T. Elevated Division | | |
| Oct. 24 | 1,109,003 | |
| July 12 | | 1,227,047 |
| B.-M.T. New York Rapid Transit | | |
| Dec. 19 | 2,105,989 | |
| July 12 | | 2,095,146 |

The subway division of the I.R.T. with a traffic of 897,700,000 passengers made the greatest gain during the year, with an increase of 83,100,000 passengers, or 10.2 per cent. The elevated division of the Interborough carried 7,800,000 fewer passengers than during the preceding year. The B.-M.T. lines carried 669,600,000 passengers for the 1928 fiscal year; an increase of 13,000,000 or 2 per cent for 1927. The street surface lines in Manhattan lost nearly 15,800,000 passengers and in Richmond nearly 6,800,000. Bronx street surface lines gained about 8,500,000, Brooklyn gained about 1,650,000, and Queens gained about 750,000.

For the fiscal year ended June 30, 1928, the I.R.T. lines showed an increase in operating revenue amounting to $3,889,206. B.-M.T. lines showed an increase in operating revenue of $693,343. The elevated division of the I.R.T. showed a loss in operating revenue amounting to $456,744. Surface line companies operating in five boroughs showed a decrease of $694,278 in operating revenue for the fiscal year ended June 30, 1928.

Total operating revenues of all street railway lines in New York City amounted to $157,065,000 for the fiscal year 1928, or $3,888,000 more than the preceding fiscal year. Rapid transit lines passed the $100,000,000 mark with total operating revenues of $101,928,000, an increase over the preceding fiscal year of $4,582,000. The street surface lines had a total operating revenue of $55,137,000, a decrease of about $694,000.

Among the Manhattan surface companies, the New York Railways Corporation had the biggest decrease in revenue. That company's shrinkage was $324,369. Street surface companies in Queens reported an increase in operating revenue. The Brooklyn surface companies reported an increase in passenger revenue of $91,000, which was more than offset by the decrease of $99,000 in revenue from freight operations on the South Brooklyn Railway, making the total operating revenues of the Brooklyn surface companies show a decrease of $4,000. Street surface companies in the Bronx, all included in the Third Avenue Railway, reported an increase in revenues of $428,000.

Dividends declared during the fiscal year ended June 30, 1928, were as follows:

By the New York Rapid Transit Corporation on 282,760 shares of capital stock (no par value), $16 per share.

By the South Brooklyn Railway on $500,000 capital stock, 8 per cent.

By the Manhattan Bridge Three-Cent Line on $450,000 in capital stock, 3 per cent.

By the Hudson & Manhattan Railroad on preferred stock, par value, of ap-

TABLE SHOWING DISTRIBUTION OF NEW YORK TRAFFIC

| | Fiscal Year Ended June 30 1926 | 1927 | 1928 |
|---|---|---|---|
| Rapid transit lines | | | |
| I. R. T. subway division | 784,280,073 | 814,626,596 | 897,693,467 |
| I. R. T. elevated division | 346,204,574 | 359,019,660 | 351,258,534 |
| Total I. R. T. Company | 1,130,484,647 | 1,173,646,256 | 1,248,952,001 |
| N. Y. Rapid Transit (B.-M.T.) | 621,251,881 | 656,543,693 | 669,552,744 |
| Total, rapid transit | 1,751,736,528 | 1,830,189,949 | 1,918,504,745 |
| Street surface lines | | | |
| Manhattan | 335,663,087 | 324,297,970 | 308,590,199 |
| Bronx | 133,353,069 | 144,610,327 | 153,143,745 |
| Brooklyn | 474,872,275 | 477,348,475 | 479,002,035 |
| Queens, excluding B.-M.T. | 56,868,143 | 50,949,549 | 51,691,870 |
| Richmond | 16,943,627 | 17,133,068 | 10,335,834 |
| Total, street surface | 1,017,700,201 | 1,014,339,389 | 1,002,763,683 |
| Total, rapid transit and street surface | 2,769,436,729 | 2,844,529,338 | 2,921,268,428 |
| Hudson & Manhattan Railroad | 108,826,762 | 112,318,329 | 112,487,043 |
| Bus lines | | | |
| Fifth Avenue Coach Co. | 69,425,753 | 70,405,169 | 67,283,025 |
| Eastern Parkway, Brownsville & East New York Transit Relief Association, Inc. | (a) 7,146,492 | 9,941,785 | 9,605,171 |
| Nassau Bus Lines, Inc. | 1,369,682 | 1,479,990 | 1,345,879 |
| New Drop Beach Bus Service, Inc. | ..... | (b) 204,511 | 331,771 |
| Surface Transportation Corp. of New York | ..... | ..... | (c) 7,520,571 |
| Total, bus (d) | 77,941,927 | 82,031,455 | 86,086,417 |
| Grand total (e) | 2,956,205,418 | 3,038,879,122 | 3,119,841,888 |
| Population (f) | 6,131,944 | 6,217,260 | 6,302,576 |
| Fares per capita | 482 | 489 | 495 |

(a)–(c) Began operation: (a) Aug. 28, 1925; (b) Sept. 3, 1926; (c) Nov. 1, 1927.
(d) Exclusive of figures for the Tompkins Bus Corporation, which are not available at this time.
(e) Exclusive of figures for the Williamsburg Bridge local line and municipal bus lines.
Figures for the fiscal year 1928 were as follows:
Williamsburg Bridge local line ..... 17,635,924
Municipal bus lines (estimated) ..... 97,750,000
(f) Estimated on basis of one-tenth of decennial. increase.

SOME OF THE STATIONS OF HEAVIEST TRAFFIC ON NEW YORK RAPID TRANSIT LINES

| | 1928 | 1927 |
|---|---|---|
| Interborough Rapid Transit Company Subway division | | |
| Times Square (all entrances) | 55,093,646 | 48,123,566 |
| Grand Central (all entrances) | 44,371,196 | 40,206,328 |
| Pennsylvania Station | 41,885,547 | 37,974,255 |
| 14th Street (Fourth Avenue) | 24,714,149 | 22,617,305 |
| Atlantic Avenue (Brooklyn) | 17,971,910 | 16,502,021 |
| Brooklyn Bridge | 16,726,080 | 15,928,952 |
| Fulton Street (Broadway) | 15,607,293 | 14,584,221 |
| 50th Street | 14,972,058 | 12,839,957 |
| Borough Hall | 14,852,274 | 13,474,123 |
| 14th Street (Seventh Avenue) | 13,936,289 | 13,044,780 |
| Total | 260,130,442 | 235,295,508 |
| Per cent of total traffic on I.R.T. subway | 28.98 | 28.88 |
| New York Rapid Transit Corporation (B.-M.T.) | | |
| Times Square (Broadway Line, Manhattan) | 34,630,250 | 32,848,000 |
| 34th Street (Broadway Line, Manhattan) | 27,648,533 | 26,584,878 |
| Union Square (Broadway Line, Manhattan) | 22,891,015 | 22,082,956 |
| Cortlandt Street (Broadway Line, Manhattan) | 15,995,383 | 15,932,040 |
| Chambers Street (Center Street Loop) | 15,086,205 | 14,985,463 |
| Essex Street (Centre Street Loop) | 14,974,169 | 15,606,447 |
| DeKalb Avenue (Fourth Ave. Line, Brooklyn) | 12,316,795 | 12,501,188 |
| Stillwell Avenue (Coney Island) | 12,145,722 | 12,270,952 |
| Park Row (Brooklyn Bridge) | 11,475,838 | 12,269,849 |
| 23rd Street (Broadway Line, Manhattan) | 11,227,896 | 11,024,543 |
| Total | 178,427,806 | 176,106,316 |
| Per cent of total traffic on N.Y.R.T. | 26.65 | 26.82 |

proximately $5,200,000, 5 per cent, and on common stock, par value, of approximately $40,000,000, 2½ per cent. Hudson & Manhattan Railroad declared interest of 5 per cent on $33,102,000 of adjustment income bonds.

Third Avenue Railway declared interest of 2½ per cent on $22,536,000 of adjustment mortgage bonds.

The Fifth Avenue Coach Company declared a dividend of 1,000 per cent on $50,000 capital stock.

The Eastern Parkway, Brownsville & East New York Transit Relief Association declared dividends of 375 per cent on $28,600 capital stock.

The accompanying table shows the number of passengers carried on rapid transit and street surface lines during the years 1928, 1927 and 1926; also the number of passengers carried by the Hudson & Manhattan Railroad (part of which traffic is outside of the city limits), the Fifth Avenue Coach Company, the Eastern Parkway, Brownsville and East New York Transit Relief Association, Inc., the Surface Transportation Corporation of New York, and two small bus companies, together with certain other data pertinent thereto.

## Illinois Removal Allowed

Authority to discontinue local service between Ottawa and Streator, Ill., and to remove its tracks on this 8-mile line was asked in a petition recently filed with the Illinois Commerce Commission by the Illinois Traction, Inc. The railroad has been operating supplementary motor coach service between the two cities for several months.

## A. R. Kuser Resigns in New Jersey

Col. Anthony R. Kuser, a director of Public Service Corporation of New Jersey since its formation in 1903, has resigned from the corporation and subsidiary companies as a director, due to ill health. He was also a member of the executive committee. Colonel Kuser was one of the original 24 directors of the corporation on its organization in June, 1903. He was also at that time made second vice-president, and continued as a vice-president until 1923 when he resigned, retaining his position, however, on the directorate.

## Abandonment on Northeastern Lines Deferred

Hearings were completed before the New Hampshire Public Service Commission on Dec. 19, regarding the abandoning of railway lines in Salem, N. H., by the Massachusetts Northeastern Street Railway. Counsel for the town of Salem has been allowed until Dec. 29 to file a brief and the Northeastern will have an additional five days to answer it. Although initially the railway had planned to cease operations on these lines on Dec. 26, the date for suspension was put off until after Jan. 1.

Clifton L. Bartlett, vice-president, stated at the hearing that the company had lost $150,000 in Salem during the past ten years. Prospects, he said, did not look bright for improving revenues, and $60,000 would have to be spent to make the tracks reasonably safe.

Town Counsel Chester T. Woodbury spoke for a continuation of the Salem lines. He said that many people who lived in Salem, N. H., worked in Lawrence and Haverhill and required the transportation.

## Separation in Dallas

Separation of the Dallas-Terrell interurban railway from other operations of the Texas Electric Railway has been effected with the granting of a state charter to the Dallas-Terrell Interurban Railway. Capital stock in the company consists of 90,000 shares with no par value.

Incorporators are: W. B. Head, John W. Carpenter and Richard Meriwether, Dallas, all executives of the Texas Electric Railway. The officials and directors of the two companies will remain the same, however, and ownership of stock in the new company is vested with the Texas Electric Railway. The action was taken to facilitate operation.

## $65,155 Loss on Interborough for Five Months

For the five months' period ended Nov. 30, 1928, gross revenue from all sources of the Interborough Rapid Transit Company, New York, N. Y., was $27,468,408, which represented an increase of $781,673 over a similar period of 1927. Expenditures for operating and maintaining the property totaled $17,531,504, or an increase of $1,595,850 for the five months' period ended November, 1927. The balance, after deducting the 5 per cent Manhattan dividend rental, was a deficit of $65,155, compared with a net profit of $233,181 in the five months ended Nov. 30, 1927.

## Final Accounting for Shore Line Accepted

The final accounting of Receiver Robert W. Perkins for the Shore Line Railway was accepted on Dec. 19 by Judge John Richards Booth in the Superior Court at Norwich, Conn. Judge Booth ordered the sum of $185,000 turned over to the Old Colony Trust Company, Boston, Mass. A balance totaling $8,083 is to be held by the receiver to await further jurisdiction by the court. An unsettled claim against the Shore Line Railway has yet to be considered. Action is pending in this case on a petition by the Westinghouse Company, which seeks judgment to the amount of $6,500 against the defunct railway.

## Date of Puget Sound Sale Set

Feb. 25 has been set as the date of sale of the operating properties of the Puget Sound Electric Railway, which runs the Seattle-Tacoma-Renton Interurban lines. Bids will be received until the date of sale.

## Conspectus of Indexes for December, 1928

Compiled for Publication in ELECTRIC RAILWAY JOURNAL by

ALBERT S. RICHEY

Electric Railway Engineer, Worcester, Mass.

| | Latest | Month Ago | Year Ago | Last 5 Years High | Last 5 Years Low |
|---|---|---|---|---|---|
| **Street Railway Fares*** 1913 = 4.84 | Dec. 1928 7.71 | Nov. 1928 7.69 | Dec. 1927 7.57 | Dec. 1928 7.71 | May 1923 6.88 |
| **Electric Railway Materials*** 1913 = 100 | Dec. 1928 145.5 | Nov. 1928 145.1 | Dec. 1927 140.6 | April 1923 175.3 | Feb. 1928 139.5 |
| **Electric Railway Wages*** 1913 = 100 | Dec. 1928 229.8 | Nov. 1928 229.0 | Dec. 1927 228.4 | Oct. 1928 229.9 | March 1923 206.8 |
| **Am. Elec. Ry. Assn.** Construction Cost (Elec. Ry.) 1913 = 100 | Dec. 1928 205.1 | Nov. 1928 205.7 | Dec. 1927 200.7 | March 1924 206.8 | Jan. 1923 187.3 |
| **Eng. News-Record** Construction Cost (General) 1913 = 100 | Dec. 1928 210.2 | Nov. 1928 209.5 | Dec. 1927 203.9 | March 1924 224.7 | Nov. 1927 202.0 |
| **U.S. Bur. Lab. Stat.** Wholesale Commodities 1926 = 100 | Nov. 1928 96.7 | Oct. 1928 8 | Nov. 1927 96.7 | March 1923 104.5 | April 1927 93.7 |
| **Bradstreet** Wholesale Commodities 1913 = 9.21 | Dec. 1928 13.15 | Nov. 1928 13.01 | Dec. 1927 13.53 | Dec. 1925 14.41 | July 1924 12.23 |
| **U. S. Bur. Lab. Stat.** Retail Food 1913 = 100 | Nov. 1928 157.3 | Oct. 1928 156.8 | Nov. 1927 156.5 | Nov. 1925 167.1 | May 1924 141.0 |
| **Cost of Living** Nat. Ind. Conf. Bd. 1914 = 100 | Nov. 1928 162.6 | Oct. 1928 162.9 | Nov. 1927 164.2 | Nov. 1925 171.8 | Feb. 1923 157.5 |
| **Industrial Activity** Elec. World—Kw.-hr. used 1923-25 = 100 | Nov. 1928 135.0 | Oct. 1928 132.0 | Nov. 1927 115.2 | Nov. 1928 135.0 | July 1924 73.4 |
| **Bank Clearings** Outside N. Y. City 1926 = 100 | Nov. 1928 104.0 | Oct. 1928 105.1 | Nov. 1927 100.2 | May 1928 108.4 | Aug. 1923 81.6 |
| **Business Failures** Number | Nov. 1928 1564 | Oct. 1928 1664 | Nov. 1927 1656 | Jan. 1924 2231 | Sept. 1928 1348 |
| Liabilities (Millions) | 52.07 | 41.24 | 41.62 | 122.95 | 22.11 |

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 136 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

# Personal Items

## W. G. Murrin Prepared for New Post

When George Kidd gives over the reins on Jan. 1 next to W. G. Murrin, another progressive and energetic man will hold the chief executive post connected with the British Columbia Electric Railway in Vancouver, B. C., and will likely carry on the expansion policy which characterized the service period of his predecessor and friend, both of whom, English born, found themselves in Canada in their early youth, ambitious to make their way. Mr. Kidd becomes chairman of the board of the holding company.

Back in 1903 Mr. Murrin was connected with the London Electric Lighting Company, remaining with that company until 1912, simultaneously holding the office of works manager of the London United Tramways. In 1913 he went to the Canadian property as mechanical superintendent with a reputation for resourcefulness and accomplishment which soon won for him the position of superintendent, assistant general manager and later vice-president.



W. G. Murrin

He is known as a hard worker and has also a large capacity for relaxation and social intercourse. His interest in his work is intense, but he also knows the value of an avocation, giving his attention to the Little Theatre Movement in Vancouver, as president.

Trained as an engineer and copiously endowed with experience in the operation of hydro-electric enterprises and the management of light, heat, power and tramway undertakings, Mr. Murrin, at 53, becomes president of one of the biggest enterprises in Western Canada.

## Technical Journalist Joins Bendix Corporation

David Beecroft, associated with the Chilton Class Journal Company and the Class Journal Company for 24 years, resigned on Dec. 1, 1928, to become vice-president in charge of the newly-established New York office of the Bendix Corporation. For more than eighteen years he was connected with the editorial department of the Class Journal publications, beginning with *Motor Age* in 1905 and acting as directing editor of all the Class Journal publications until his withdrawal from the editorial department in 1922.

Mr. Beecroft entered the motor vehicle industry in December, 1903, as editor of the *Automobile Review*, published weekly in Chicago, but in March, 1905, he joined the staff of *Motor Age* as technical editor and in 1908 editor.

In 1911, in addition to his editorial work on *Motor Age*, he took on the editorial work of *The Automobile*, later converted into *Automotive Industries*, and in 1913 became directing editor of the Class Journal Company, then also publishing *Motor World* and *Commercial Vehicle*. In January, 1917, he established *L'Automobile Americano* and an automobile export paper printed in Spanish.

In November, 1923, he entered the business department of the Class Journal Company. During the past two years he has devoted all of his time to studies in the automobile field, particularly market analysis.

Mr. Beecroft was president of the Society of Automotive Engineers during 1921 and previous to that he was a member of the board for several years. He was chairman of the papers committee of the society for five years.

At present he represents the American Automobile Association on the motor vehicle conference committee and has been a member of the contests board of the American Automobile Association for twenty years. Mr. Beecroft has also been active in the work of the trade paper associations.

The Bendix Corporation owns and operates the Bendix Brake Company, South Bend, Ind., and controls and operates the Eclipse Machine Company, Elmira, N. Y. Mr. Beecroft's office will be located at 2837 Grand Central Terminal Building.

Arthur G. Wadleigh, Lynn, and Fred J. Crowley, Lowell, have been reappointed by Governor Fuller to the Board of Public Trustees of the Eastern Massachusetts Street Railway, Boston, Mass.

Robert A. Pritchard, vice-president of the J. G. White Management Corporation, has succeeded James H. Pardee as president of the Equitable Coach Corporation, which has secured bus rights for Brooklyn and Manhattan from the Board of Estimate and is reported now to be in a deal under which it will be included in a new company that will take over its rights and fit in the new operation with that of the surface lines of the Brooklyn-Manhattan Transit Corporation.

## Honor for Wilhelm Stein

Wilhelm Stein, manager of the Hamburg Elevated Railway, has just received the degree of Doctor of Engineering, from the Hanover School of Technology. The degree was awarded *honoris causa*. Dr. Stein is vice-president of the German Co-ordinated Transport Association and a member of the executive committee of the International Tramway & Bus Association, with headquarters in Brussels, Belgium.

Dr. Stein was born Sept. 5, 1870, and studied mechanical engineering at both the Hanover School of Technology and in Berlin, later receiving the degree of Regierungsbaumeister. In 1897 he became associated with the Siemens & Halske Company of Berlin, and in 1898 was asked by that concern to supervise the construction of equipment of the Hamburg Elevated Railway. On its completion he was appointed general manager. After the elevated railway was consolidated with the surface lines and other means of public transport in Hamburg and became a municipal property, Dr. Stein was appointed manager of the entire system.



Wilhelm Stein

In 1926, he visited the United States and made an extended inspection trip of the electric railways and transportation facilities in this country.

Harley A. Johnson, general manager of the Chicago Rapid Transit Company, Chicago, Ill., has been spending the last two months in Europe studying heavy electric traction installations. He has been doing so as chairman of the sub-committee on European practice of the electrification of steam railroads committee, of the National Electric Light Association. Three other members of the committee accompanied him: Reinier Beeuwkes, electrical engineer of the Chicago, Milwaukee, St. Paul & Pacific Railroad; Louis E. Fischer, vice-president of the Illinois Power & Light Corporation, and Horace H. Field, secretary of the electrification of steam railroads committee of the National Electric Light Association. The party sailed from New York on Oct. 27, 1928, and expected to return from Southampton on Dec. 27, 1928. Their itinerary included England, Sweden, Germany, Switzerland, Italy and France.

# Annual Construction Programs Announced

**Tennessee Electric Power will spend $470,000 on railways. Portland Electric Power Company to make large expenditures. One hundred and six cars for Montreal**

IN CONTEMPLATION of a generally sustained commercial and industrial activity during the coming twelve months, the Tennessee Electric Power Company, Chattanooga, Tenn., and its subsidiary companies will spend the sum of approximately $5,000,000 on new construction work during 1929. This new program is equally as large as that appropriated for the current year. Construction activities of this company for the past five years have amounted to $25,000,000. The new estimate will run the total to $30,000,000 by the end of 1929.

As in former years, the greater portion of the construction budget authorized by the management will be expended on the electrical division of the property for new and additional power facilities, and for improvements and betterments in service. This amount will be around $4,500,000 including the Nashville property. Expenditures for the street railway department in Nashville and Chattanooga will total $470,000. The remainder will be utilized by the water, ice, and telephone division for general business requirements.

A number of service improvements will be made at the power houses, including the installation of temperature recording apparatus on each of the fourteen generators. Mica insulated windings will be provided for two of the present 4,200 hp. generators, thereby increasing the hp. rating of each, 2,000.

The Portland Electric Power Company has announced expenditures of $15,850,000 for the next year, $2,000,000 of which will go into new construction. A large part of this will be spent in extending the lines of the company and in additions to power plants and substations. $400,000 will be spent for railway improvements and about $1,500,000 for substation improvement and extensions.

### Cars for Montreal

The purchase of 106 cars by the Montreal Tramways Company, Montreal, Que., has been authorized by the Montreal Tramways Commission. These cars to be ordered from the Canadian Car & Foundry Company will consist of 50 two-man cars similar to the last group of cars received, 30 one-man cars similar to the present class 1950, 20 one-man cars with draw bars fitted at the front end to permit each car to be used as a trailer and hauled by any of the 2100 class cars, and 6 double-end one-man, two-man cars with platforms arranged for double end operation with either one man or two men. The company will order 30 more of the one man type 1950 cars, if the present coupling plan works out satisfactorily.

The Chicago South Shore and South Bend Railroad, Michigan City, Ind., is installing two new freight switching connections, one at Burnham, Ill., and the other at Shearson, Ind. At Burnham, a new main line track for West Farm trains will be built to the north of the present double track and main line. The former east bound main track will then become a yard track with two additional yard tracks paralleling it to the south, also 1,500 ft. of tail track. The yard when completed, about March 1, will run 5,500 ft. west of the state line at Hammond to Burnham, and will greatly facilitate the handling of increasing carload shipments by the Belt Railway.

At Shearson, Ind., a new single receiving track, connecting with the Indiana Harbor Belt Railroad, is being built. This track is going in south of the main line for a distance of 2,000 ft. It will be used as a new receiving track, the present interchange going over to delivery only. Seventy lb. rail is being laid on treated ties. Construction work on the New York Central connection at South Bend, and the Michigan-Central Monon route interchanging at Michigan City, is virtually finished.

The railway project for Mount Hood in Oregon is still under consideration, the latest development being when J. L. Meier of Portland, chairman of the special committee, personally delivered to the Secretary of Agriculture at Washington, D. C., an answer from Portland interests. This was a reply to the secretary's decision postponing action of any definite nature on this proposed project. The Portland committee is trying to speed up a favorable and early reaction to the plan for the railway.

The Pacific Electric Railway, Los Angeles, Cal., has placed an order with the Union Switch & Signal Company for alternating current, automatic block signalling material to be installed on the Pasadena Short Line between Indian Village and Newton Park, Cal. This installation will comprise 34 color light signals, 56 impedance bonds, 55 relays with the necessary transformers, reactors, copper oxide rectifiers and housings. New 122-lb. rail has been installed by the East St. Louis Railway Company, East St. Louis, Ill., on Collinsville Avenue from Missouri to Illinois Avenues. The rail joints were thermit welded, and ready mixed concrete was delivered to the job by trucks. The cost of the complete installation was approximately $25,000. The Toronto Transportation Commission has recently purchased land for the construction of a loop on the east side of Mutual Street, just North of Queens Street, Toronto.

During the year 1928 the Worcester Consolidated Street Railway, Worcester, Mass., completed 14,000 ft. of track. In this work there was used 420 tons of 7-in. girder rail, 14,500 ties, 15,000 tie plates, and 3,500 flat tie rods. There were special work renewals in 22 locations in various parts of the city, at an expenditure of about $35,000.

### Building Construction

The St. Louis Public Service Company, St. Louis, Mo., will build an addition to its mechanical shop and operating building, to cost $45,000. The Iowa Railway & Light Corporation, Cedar Rapids, Iowa, plans on operating a building at Marshalltown, Iowa, to cost about $70,000. A railway company in northern New York State has purchased transformers costing $30,000.

It is reported that a model town is being laid out on the bank of Flin Flon Lake, Manitoba, about 3 miles from the Flin Flon Mine, and that it is proposed to build an electric railway from the town to the mine, for the convenience of the company's employees. The Montreal Tramways Company has prepared plans for the construction of a viaduct at Atwater Avenue, across the Canadian National Railway tracks, for electric railway traffic only. This company is building approximately 2.25 miles of track in various locations, and is contemplating the construction of approximately 2 additional miles.

The Nova Scotia Light & Power Company, Halifax, Nova Scotia, is building a single track extension, 1,494 ft. in length. The Ottawa City Counsel, Ottawa, Ont., has let a contract for the construction of a viaduct at Somerset Street, at a cost of $119,025. The City Counsel has discussed the raising of about $145,000 to pay the cost of the structure, including the cost of sidewalks, land damages, etc. The Ottawa Electric Railway is to pay 60 per cent of the viaduct's cost.

Los Angeles Railway, Los Angeles, Cal., has placed orders for two twin

coaches and one White 29-passenger single-deck treadle door motor coach for use on its lines. The Pacific Electric Railway and the Los Angeles Railway have each ordered three twin coaches, making a total of six to be placed in service on the Western Avenue lines of the Los Angeles Motor Coach Company. The Alabama Power Company, Birmingham, Ala., has completely rebuilt one of its 56-passenger cars. It is equipped with new trucks, electric heaters, air brakes, and all other equipment was thoroughly overhauled.

The three-story brick building used as a carhouse, repair shop and paint shop, at Jamestown, N. Y., by the Jamestown Street Railway Company and the Jamestown, Westfield and Northwestern Railroad has been practically destroyed by fire and the loss was placed at close to $80,000. Three street cars were consumed in the blaze, one a large center entrance interurban unit and two city-type cars.

## U. S. World Trade Increasing

The foreign trade of the United States is forging ahead steadily, according to the quarterly report on the value and volume of the principal exports and imports between the United States and its chief foreign markets, issued by the foreign commerce department of the Chamber of Commerce of the United States. The general expansion of this country's foreign commerce is now indicated clearly by a comparison of the statistics for the January-September period of 1928 with the average of the same nine months from 1923 to 1927. The foreign trade of the United States for the first three quarters of 1928 totaled $6,628,000,000, nearly 5 per cent greater than the average of the five corresponding nine-month periods of 1923 to 1927.

Exports amounting to $3,559,000,000, the largest since 1920, is 1.4 per cent above 1927 and 8 per cent over the above mentioned average. Imports amounting to $3,070,000,000, though 2.7 per cent below the 1927 total, were still 1.5 per cent above the 1923 to 1927 average receipts. While exports for the third quarter of 1928 exceeded $1,000,000,000 for the seventeenth consecutive quarter, imports for the quarter fell below $1,000,000,000 for the first time since 1924. Exports of foreign merchandise (re-exports), included with total exports, amounted to $76,037,000 or $4,830,000 lower than last year. Owing to a heavy demand for gold by countries which were placing their currencies on a gold basis, exports of that metal in the January to September period of 1928 were especially heavy, totalling $535,216,000 as against imports of $100,026,000.

Exports of finished manufactures have shown a steady increase from the $1,120,000,000 total for the first three quarters of 1923 to $1,668,000,000 for the nine months of 1928, a gain of almost 50 per cent. Compared with 1927, this group shows a gain of nearly 11 per cent and was 25 per cent above the 1923-1927 average. Finished manufactures constitute nearly 48 per cent of the total exports, a proportion exceeded only in 1916 during the World War.

Exports of semi-manufactures increased from $417,911,000 in 1923 to $537,615,000 in 1928, a gain of 28 per cent. Their gain over 1927 was less than 2 per cent, though 13 per cent above the 1923-27 average. To these two groups of manufactured goods is due largely the extraordinary expansion of the United States export trade.

The course of the crude material group has been uneven with a decided upward trend from 1923 to 1925, and then a severe decline in 1926. In the last three years, however, this group has varied little, the 1928 figures being 2 per cent below the 1923 to 1927 average. Imports of raw materials by value were 9.6 per cent lower than a year ago and 4 per cent lower than the average of the previous five years. Imports of finished manufactures continue their advance and were 10 per cent above the average.

Perhaps the most striking example of the expansion of exports of manufactures is the continued increase in exports of automobiles, parts and accessories, the total value of which increased 77 per cent as compared with the average for the past five years, and was above the record set last year. Machinery exports, lead by industrial machinery, showed an increase in value of 12 per cent above 1927 and 33 per cent above the 1923 to 1927 average. Electrical machinery and apparatus, 4 per cent above 1927, was 16 per cent above the average. The value of exports of metals was up 5 per cent over last year, shipments abroad of semi-manufactures of iron and steel advancing 3 per cent, steel mill products 8 per cent and advanced manufactures of iron and steel 7 per cent. Exports of non-ferrous metals increased over 4 per cent.

Export of railway cars, although not one of the important exports, showed a considerable gain over 1927. Freight cars exported from January to September, 1928, numbered 2,279 as compared to 2,085 in the same period during 1927, or a gain of 9.3 per cent. The number of passenger cars exported during the three quarters of 1928 was 320 as compared to 215 exported during the same period in 1927, making a gain of 48.8 per cent.

# Weekly Business Conditions

Steel plants showed lessened activity during the week ended Dec. 22, as compared with the preceding week, but were almost 20 per cent more active than a year ago, according to the weekly statement of the Department of Commerce. The volume of money turnover, as indicated by check payments, was greater than in either prior period. Employment in Detroit factories, indicating the activity of the automobile industry, was seasonally smaller than in the preceding week but showed a substantial gain over the same period of 1927. Petroleum output during the last reported week showed gains over both periods. Lumber production, however, showed declines from both the preceding week and the same period of last year. Bituminous-coal production, on the other hand, though declining from the previous week, was greater than a year ago.

The general index of wholesale prices was slightly stronger than in the preceding week, being still somewhat higher than a year ago. Prices for iron and steel showed no change from the previous week but were higher than a year ago. Copper prices, showing no change from the previous week, were considerably higher than for the same period last year.

Loans and discounts of federal reserve member banks showed only slight change from the previous week but were higher than a year ago. Interest rates on time money averaged higher than in either the preceding week or in the same period of last year. Prices for stocks recovered from the level of the preceding week. Bond prices, reflecting higher interest rates, were still lower than in either the preceding week or the same period of 1927. Business failures were less numerous than in either the previous week or the same period of 1927.

## Weekly Business Indicators

(Weeks ended Saturday. Average 1923-25 = 100)

| | 1928 | | | | 1927 | | | |
|---|---|---|---|---|---|---|---|---|
| | Dec. 22 | Dec. 15 | Dec. 8 | Dec. 1 | Dec. 24 | Dec. 17 | Dec. 10 | Dec. 3 |
| Steel operations | 105.3 | 107.9 | 110.5 | 109.2 | 88.0 | 83.0 | 80.0 | 87.0 |
| Bituminous coal production | ..... | 113.1 | 115.0 | 101.6 | 100.7 | 100.4 | 99.4 | 92.9 |
| Lumber production | ..... | 90.0 | 92.3 | 80.9 | 88.2 | 102.3 | 104.5 | 102.3 |
| Petroleum production (daily average) | ..... | 122.3 | 121.0 | 120.3 | 116.8 | 118.0 | 119.4 | 119.1 |
| Freight-car loadings | ..... | ..... | 102.7 | 93.8 | 86.5 | 90.5 | 91.5 | 95.5 |
| Building contracts 37 states (daily average) | 105.5 | 101.6 | 106.0 | 171.2 | 121.1 | 124.9 | 142.9 | 102.4 |
| Price iron and steel, composite | 87.5 | 87.5 | 87.3 | 87.3 | 84.8 | 84.8 | 84.8 | 85.0 |
| Copper, electrolytic, price | ..... | 114.5 | 114.5 | 114.5 | 100.0 | 99.3 | 100.8 | 100.0 |
| Bank loans and discounts | ..... | 130.3 | 131.0 | 130.1 | 122.9 | 122.4 | 122.2 | 121.7 |
| Interest rates, call money | 178.8 | 190.9 | 218.2 | 181.8 | 103.0 | 97.0 | 103.0 | 100.0 |
| Business failures | 120.6 | 123.3 | 110.1 | 102.5 | 122.4 | 123.6 | 122.6 | 110.6 |
| Interest rates, time money | 188.6 | 177.1 | 168.6 | 160.0 | 97.1 | 97.1 | 97.1 | 97.1 |
| Federal reserve ratio | 83.2 | 82.8 | 83.6 | 84.1 | 86.7 | 89.3 | 91.2 | 91.9 |

## Cincinnati Car Offers New Line of Industrial Locomotives

The Cincinnati Car Corporation, Cincinnati, Ohio, now offers to users of industrial haulage and switching equipment a complete line of industrial locomotives in gasoline, gasoline-electric, Diesel, electric trolley and storage battery types, known as the Cincinnati line.

These locomotives will be furnished in a variety of sizes from small 2 and 3-ton units up to 50-ton, or larger, and in various track gages, affording equipment suitable for handling either small or large industrial cars in all kinds of service, as well as for switching railroad cars, for which a pronounced demand has developed among shippers and receivers of carload freight, as well as among the steam railroads for use in small terminals on short divisions.

The company has been building electric trolley type locomotives of various sizes for years and many of the proven features of design in this type are incorporated into the additional types, particularly the gas-electric. Different features of design otherwise are based on the experience of a part of its present organization extending over 15 years in the gasoline locomotive field, and involve the most up-to-date mechanical and construction ideas and principles. Ruggedness, ample power, simplicity and accessibility are the prime features sought throughout all of the different types and models.

H. R. Sykes, who is one of the pioneers in the development, manufacture and sale of industrial locomotives, and who is well known to many of the locomotive using public, will be in charge of sales and service of the locomotive division.

Two of its popular size gasoline-powered locomotives will be exhibited at the coming show of the American Road Builders' Association at Cleveland in January.

## Welded Chain Simplification Ready for Acceptance

The division of simplified practice of the U. S. Department of Commerce has sent copies of the proposed simplified practice recommendation, for welded chain, to manufacturers, distributors and users of this commodity for acceptance. This recommendation was approved at a general conference of all interested elements in the industry, held under the auspices of the division of simplified practice at the Department of Commerce on Nov. 15.

The simplified list of sizes and varieties is based on a careful survey of existing conditions and requirements in the industry. When the recommendation has been accepted by the industry as a whole, it will become effective for new production on Feb. 1, 1929, subject to annual review thereafter. A standing committee representing all interests was appointed at the general conference. This committee will review the project one year after the effective date, and will then either reaffirm the recommendation for another year, or modify it to meet changed conditions or new developments in the industry.

## METAL, COAL AND MATERIAL PRICES F. O. B. REFINERY

| | Dec. 26, 1928 |
|---|---|
| **Metals—New York** | |
| Copper electrolytic, cents per lb | 16.025 |
| Copper wire, cents per lb | 18.125 |
| Lead, cents per lb | 6.5 |
| Zinc, cents per lb | 6.7 |
| Tin, Straits, cents per lb | 49.875 |
| **Bituminous Coal, f.o.b. Mines** | |
| Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons | $4.375 |
| Somerset mine run, f.o.b. mines, net tons | 1.875 |
| Pittsburgh mine run, Pittsburgh, net tons | 1.80 |
| Franklin, Ill., screenings, Chicago, net tons | 1.425 |
| Central, Ill., screenings, Chicago, net tons | 1.15 |
| Kansas screenings, Kansas City, net tons | 1.625 |
| **Materials** | |
| Rubber-covered wire, N. Y., No. 14, per 1,000 ft | $5.5 |
| Weatherproof wire base, N.Y., cents per lb. | 18.75 |
| Cement, Chicago net prices, without bags | 2 05 |
| Linseed oil (5-bbl. lots) N. Y., cents per lb. | 10.4 |
| White lead in oil (100-lb. keg), N. Y., cents per lb | 13.2 |
| Turpentine (bbl. lots), N. Y., per gal | 0.66 |

## ADVERTISING LITERATURE

South Bend Lathe Works, South Bend, Ind., has issued a new booklet No. 23, describing the new model 9-in. junior South Bend back-geared screw cutting lathe, showing a variety of sizes and drives. In this booklet is shown for the first time the new horizontal motor drive which is fully illustrated and described. Aside from the complete description of these lathes, the catalog contains a number of detailed illustrations, showing the practical jobs which may be executed with this new model. A copy of this booklet will be mailed postpaid to anyone desiring it.

St. Louis Car Company, St. Louis, Mo., has issued a catalog, No. 106, illustrating the new Birney car. The features of this car, and the new Type B.A. 50 double-truck used, are shown by detailed pictures and drawings. Aside from a complete description of the features of the car, this catalog contains full specifications of all the equipment used.

Chausse Oil Burner Company, Elkhart, Ind., has issued circular No. 14, descriptive of Chausse oil burning concrete mixers, heaters and kerosene torches. Other equipment described in this bulletin includes portable asphalt plants, tar kettles, tool heaters, oil burning surface heaters and self-heating smoothing irons.

Barrett, Haentjens & Company, Hazleton, Pa., has issued a new pamphlet, describing a method used to make suction lift centrifugal pumps automatic. This bulletin, while dealing with but one automatic pumping system, is of rather general interest since this is the system most commonly used. It shows how the centrifugal pump can be started and stopped by a float switch, push button, pressure regulator, or time switch. It explains the way in which the pump is primed, and describes the several devices used to protect the pump and electrical equipment against damage due to loss of prime, suction air leaks, a broken discharge pipe, and many other adverse operating conditions.

General Electric Company, Schenectady, N. Y., has issued bulletin GEA-971, descriptive of the gas-electric railway car. This bulletin contains illustrations, operating charts and tables, and a detailed description of this type of car. Other bulletins recently issued by this company include GEA-408A, describing electric heating equipment for industrial ovens; GEA-876B, describing the type WD-400-A arc welder; GEA-874C, describing type WD-200A arc welder; GEA-569B, describing potential arc welding sets; GEA-881A, describing General Electric arc welder, gas-engine driven; and GEA-878 which contains a description of a testing set for railway circuit breakers.

Stuebing Cowan Company, Cincinnati, Ohio, in collaboration with railroad representatives, Leeds, Tozzer & Company, New York, N. Y., has just issued an interesting pamphlet entitled "Straight Line Trucking" which describes the use of the lift truck platform system by railroads and other common carriers.

Wagner Electric Corporation, St. Louis, Mo., has just issued a new 52-page catalog describing Wagner distribution transformers in single-phase and three-phase, pole-type and subway-type, in ratings up to and including 500 kva.

## TRADE NOTES

Synthane Corporation, in September, 1928, under the laws of Delaware, is completing the building of its plant at Oaks, near Philadelphia, Pa., and expects to commence production of Laminated Bakelite products in the early spring. R. R. Titus, formerly vice-president and general manager of the Diamond State Fibre Company and the Celeron Company of Bridgeport, Pa., heads the corporation as president, with J. B. Rittenhouse as vice-president and George J. Lincoln, secretary and treasurer.

Wagner Electric Corporation, St. Louis, Mo., announces the addition of R. L. Matthews to the sales force of its Chicago branch office.

Hisey-Wolf Machine Company, Cincinnati, Ohio, manufacturer of electric drills, grinders and buffers, has recently opened a branch office at 549 West Washington Boulevard, Chicago, Ill. The office will be in charge of Roy D. Haworth, who will be a direct representative.



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Transportation, Traffic, Operating Surveys
Better Service—Financial Reports
Appraisals—Management
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ENGINEERS
PUBLIC UTILITIES & INDUSTRIALS
Design Construction Management
Examinations Reports Valuations
CHICAGO NEW YORK SAN FRANCISCO

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*Consulting Engineers*
Appraisals Reports Rates Service Investigation
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*Engineering and Management, Construction*
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*Consultant on* Fares and Motor Buses
The Weekly and Sunday Pass—Differential Fares—Ride Selling
Holbrook Hall 5-W-3
160 Gramatan Ave., Mt. Vernon, N. Y.

**HEMPHILL & WELLS**
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**McCLELLAN & JUNKERSFELD**
Incorporated
ENGINEERING AND CONSTRUCTION
Examinations—Reports—Valuations
Transportation Problems—Power Developments
68 TRINITY PLACE NEW YORK

**KELKER, DeLEUW & CO.**
CONSULTING ENGINEERS
REPORTS ON
Operating Problems Valuations Traffic Surveys
111 W. Washington Street, Chicago, Ill.

**SGARR TRANSPORTATION SERVICE, INC.**
*Railway and Highway Consulting Engineers*
An organization of experienced engineers, prepared to assist you in the installation of highway operations as a substitute for or a supplement to your rail operations.
225 BROADWAY, NEW YORK

**E. H. FAILE & CO.**
*Designers of*
Garages— Service Buildings— Terminals
441 LEXINGTON AVE. NEW YORK

**THE P. EDWARD WISH SERVICE**
50 Church St. NEW YORK — *Street Railway Inspection* DETECTIVES — 131 State St. BOSTON

When writing the advertiser for information or prices, a mention of the Electric Railway Journal would be appreciated.

*That perplexing problem*

Modern transportation is responsible for many problems—many of them complicated and requiring a very considerable amount of technical research before they can be answered with accuracy.

The trained viewpoint of engineering service, focused on these problems, will assist you in their solution.

W H Sawyer
PRESIDENT.

STEVENS & WOOD, Incorporated
*Engineers and Constructors*
20 Pine Street, New York
Chicago . . Youngstown, O.

*A Personalized Service*

# Arc Weld Rail Bonds

AND ALL OTHER TYPES

*Descriptive Catalogue Furnished*

American Steel & Wire Company

CHICAGO, NEW YORK, BOSTON, CLEVELAND, WORCESTER, PHILADELPHIA, PITTSBURGH, BUFFALO, DETROIT, CINCINNATI, BALTIMORE, WILKES-BARRE, ST. LOUIS, KANSAS CITY, ST. PAUL, OKLAHOMA CITY, BIRMINGHAM, MEMPHIS, DALLAS, ATLANTA, DENVER, SALT LAKE CITY

EXPORT REPRESENTATIVE: U. S. STEEL PRODUCTS CO., NEW YORK. PACIFIC COAST REPRESENTATIVE: U. S. STEEL PRODUCTS COMPANY, SAN FRANCISCO, LOS ANGELES, PORTLAND, SEATTLE.

## Kalamazoo Trolley Wheels

The value of Kalamazoo Trolley Wheels and Harps has been demonstrated by large and small electric railway systems for a period of thirty years. Being exclusive manufacturers, with no other lines to maintain, it is through the high quality of our product that we merit the large patronage we now enjoy. With the assurance that you pay no premium for quality we will appreciate your inquiries.



THE STAR BRASS WORKS
KALAMAZOO, MICH., U. S. A.

## NACHOD & UNITED STATES SIGNAL CO., INC.

LOUISVILLE, KY.

BLOCK SIGNALS
FOR
ELECTRIC RAILWAYS
HIGHWAY CROSSING SIGNALS





## Johnson Electric Fare Boxes



and overhead registers make possible the instantaneous registering and counting of every fare. Revenues are increased 1½ to 5% and the efficiency of one-man operation is materially increased. Over 5000 already in use.

**Johnson Fare Box Co.**
*4619 Ravenswood Ave., Chicago, Ill.*

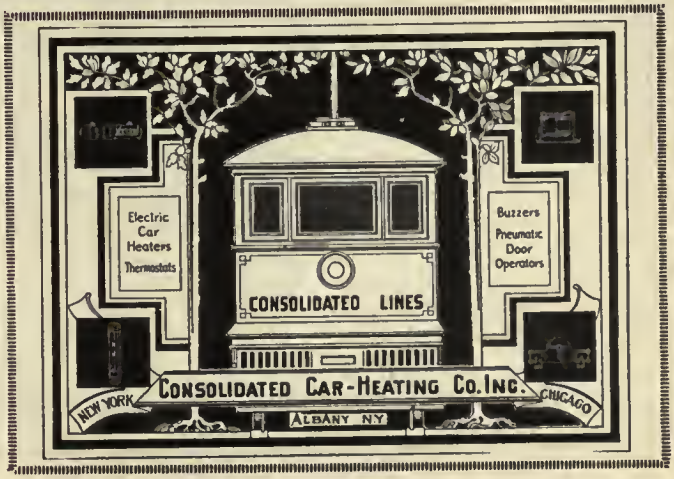
## GOLD CAR HEATING & LIGHTING CO.

220 36th St., Brooklyn, N. Y.

ELECTRIC HEATERS WITH OPEN COIL OR ENCLOSED ELEMENTS
THERMOSTAT CONTROL—VENTILATORS
WRITE FOR NEW CATALOGUE

## Your Name

in this space in all issues where larger display space is not used backs up your advertising campaign and keeps your name in the alphabetical index.




*Send for* Bulletin No. 2 *describing*

## MASTER LIVE LINE TOOLS

Master Pliers, the powerful, unbreakable pliers, cost no more than ordinary types. Send for literature.

MASTER PLIER CORPORATION
7330 Harrison Street Forest Park, Illinois

# Heralding a year of activity and progress

*The*

# ANNUAL STATISTICAL ISSUE

of

## Electric Railway Journal

*January 12, 1929*

This important issue is being awaited with even greater interest than usual. It will chronicle the achievements of a year that has seen encouraging progress. And it will forecast an increasingly optimistic picture for 1929.

The contents of the issue will include the basic statistics for 1928; a complete picture of the Industry's budgets for 1929; high spots of the year's progress in financing, construction, operation and maintenance, and a review of the advances made by manufacturers.

The advertising pages will, as usual, form an important new year exhibit of the latest in equipment, materials and supplies.

## Advertising forms close JANUARY 2nd



THIS MAN IS COMFORTABLE AT HOME

# IS HE COMFORTABLE IN YOUR CARS?

When a chair at home is too near the heat or too far from the light, it can easily be *moved* into proper relation. But the seats, lights, windows and heaters on a trolley car are in a *fixed immovable position.*

Once uncomfortable upon a car—always uncomfortable. It is necessary, therefore, to bring these factors into right relation at the start and a Hale & Kilburn seating engineer, working with you from the beginning of the design of the car, will assure the maximum degree of final comfort.

We have half a century's experience to aid, not only in providing the most practical *arrangement* of these comforts, but in providing the most practical and comfortable type of *seat* for every type of city and inter-city service.



The H. & K. No. 900D Double Chair has brought street railway seating to the highest point of modern luxury and comfort. It is, however, but one of the many Hale & Kilburn styles developed to fulfill this function in all fields of transportation.

## HALE & KILBURN SEATS

*"A Better Seat for Every Type of Modern Transportation Service"*

HALE & KILBURN COMPANY

**General Offices and Works: 1800 Lehigh Avenue, Philadelphia**

SALES OFFICES

Hale & Kilburn Co., Graybar Bldg., New York
Hale & Kilburn Co., McCormick Bldg., Chicago
E. A. Thornwell, Candler Bldg., Atlanta
Frank F. Bodler, 903 Monadnock Bldg., San Francisco
T. C. Coleman & Son, Starks Bldg., Louisville
W. L. Jefferies, Jr., Mutual Bldg., Richmond
W. D. Jenkins, Praetorian Bldg., Dallas, Texas
H. M. Euler, 146 N. Sixth St., Portland, Oregon
C. S. Wright Co., 66 Temperance St., Toronto, Ont., Canada

# because of



The La Cuba S. A., bus operators in Havana, have purchased 100 Studebaker "75" heavy duty bus chassis for city service.

Preference for Studebakers was based upon superior design and quality, plus the low cost of these powerful units.

Brilliant performance of Studebakers on many of the world's most difficult bus routes is proof positive of Studebaker quality, famous for more than three quarters of a century.

# STUDEBAKERS are



# Lower first cost

You get more for your bus dollar in Studebakers because these busses cost less to buy. They are lower in price than any other quality bus of comparable power and capacity.

# Lower operating cost

Studebaker busses cost less to operate as proved by the books of Studebaker bus operators in every section of the country. The C. S. B. & N. I. R. R. report a total operating cost of .0624 per mile with their "75" busses, exclusive of drivers' wages.

# Lower maintenance

Highest quality materials, precision, workmanship and rigid inspections insure exceptionally long life and freedom from mechanical difficulty. The Southern Kansas Stage Lines write: "Six of our Studebakers have covered 50,000 miles without one cent for repairs except valve grinding."

# Lower depreciation

Studebaker busses have a notably low rate of depreciation because of their low first cost and the tremendous mileage which is built into them. For instance, J. A. Snyder Transportation Company of Joplin, Missouri writes: "Four of our Studebakers have gone over 100,000 miles. Two of these more than 200,000 miles, and all of our Studebakers are giving perfect service."

**STUDEBAKER BUS MODELS AND PRICES**

**75 Junior Chassis—158-inch W. B.**

| | |
|---|---|
| Chassis only, single or dual rear wheels | $2410 |
| 15-Passenger Cross-Seat Sedan | 4520 |

**76 Special Chassis—184-inch W. B.**

| | |
|---|---|
| Chassis only, single or dual rear wheels | $2775 |
| 22-Passenger Seminole Observation Parlor Car | 6395 |

**75 Heavy Duty Chassis—184-inch W. B.**

| | |
|---|---|
| Chassis only, dual rear wheels | $3275 |
| 21-Passenger Street Car Bus | 5895 |

All prices F. O. B. Factory. Purchase can be arranged on Studebaker's liberal budget payment plan.

THE STUDEBAKER CORPORATION OF AMERICA,
Dept. B South Bend, Ind.

Please send complete information on Studebaker Busses, without obligation.

We have _____ busses at present. Check below the Studebaker Bus about which you desire information.

Body Model: Sedan ___ Seminole ___ Street Car ___

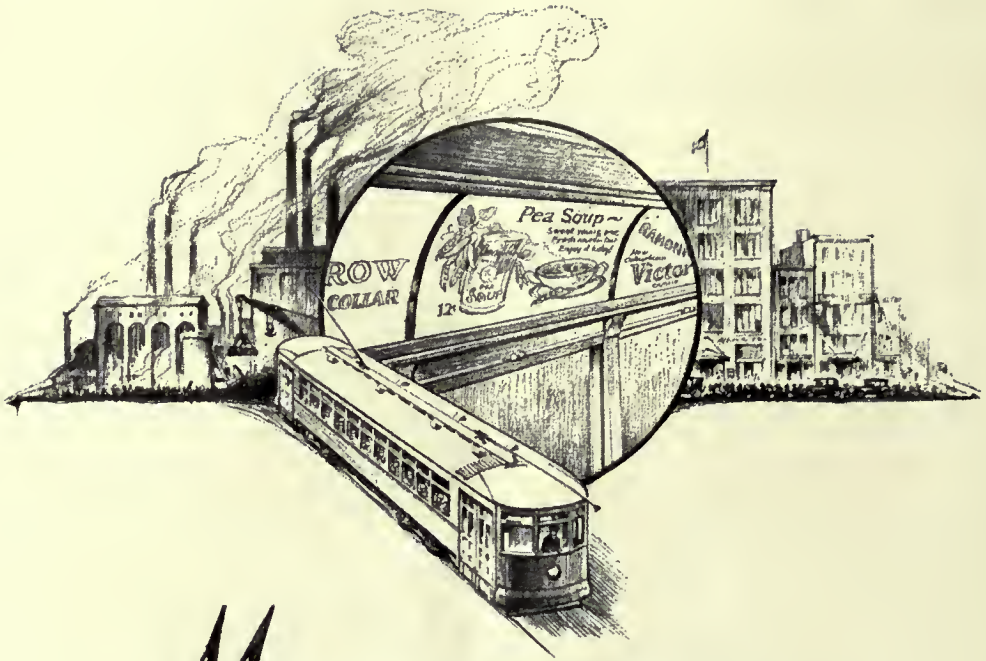
Name _____

Address _____

City _____ State _____

B-1-29

# Profit Makers




# *Mutual Service*

TO the manufacturers and distributors of America and the street railway systems that transport the millions of America's potential buyers, Collier offers a mutual service.

This service has brought the street railway riders in thousands of cities and towns throughout the country to look upon car cards as extremely useful and pleasing features of up-to-date street car service. It has given national and local advertisers a medium thru which they can get their messages to selected territories easily, economically and convincingly.

Our business is one of service—service to the street railway industry, service to America's National and local advertisers, service to the millions of people who daily ride on street cars.

**Barron G. Collier**
INCORPORATED,

CANDLER BUILDING
NEW YORK, N. Y.

# AMERICAN BRIDGE COMPANY

71 Broadway, New York



*Highway Bridge across Russian River at Guerneville, Cal.*

*Manufacturers of Steel Structures of all classes, particularly*

## BRIDGES AND BUILDINGS

HIGHWAY BRIDGES

POWER HOUSES BOILER HOUSES

ROOF TRUSSES COLUMNS, GIRDERS

*Offices in Principal Cities*

# LORAIN

Girder Rails, Special Trackwork, Switches, Frogs and Crossings in Solid Manganese Steel, Manganese Insert Construction, Chrome Nickel Steel Insert Construction and Built-up Construction of all heights and weights of rail

## The Lorain Steel Company

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

General Offices: Johnstown, Pennsylvania

*Sales Offices:*

Atlanta Chicago Cleveland Dallas New York Philadelphia Pittsburgh

Pacific Coast Representatives: U. S. Steel Products Co., San Francisco, Seattle, Portland, Los Angeles
Export Representatives: United States Steel Products Co., New York

# SEARCHLIGHT SECTION

## USED EQUIPMENT & NEW—BUSINESS OPPORTUNITIES

UNDISPLAYED—RATE PER WORD:

*Positions Wanted*, 4 cents a word, minimum 75 cents an insertion, payable in advance.

*Positions Vacant* and all other classifications, 8 cents a word, minimum charge $2.00.

*Proposals*, 40 cents a line an insertion.

INFORMATION:

*Box Numbers* in care of any of our offices count 10 words additional in undisplayed ads.

*Discount* of 10% if one payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER INCH:

1 to 3 inches.....$4.50 an inch
4 to 7 inches..... 4.30 an inch
8 to 14 inches..... 4.10 an inch

Rates for larger spaces, or yearly rates, on request.

*An advertising inch* is measured vertically on one column, 3 columns—30 inches—to a page.

R.J.

### POSITIONS WANTED

SUPERINTENDENT transportation, with broad experience, clean, successful record, high-grade references, available short notice; would consider position of assistant superintendent with a future; can arrange for personal interview; correspondence invited. PW-149, Electric Railway Journal, 1600 Arch St., Philadelphia, Pa.

SUPERINTENDENT transportation; 18 years' successful experience covering every phase of transportation, seeks position with future. Best of references. PW-153, Electric Railway Journal, Tenth Ave. at 36th Street, New York.

### WANTED

WANTED

BIRNEY CARS

Two to Four Single Truck, double end. Give complete description and lowest price.

THE UNION TRACTION COMPANY
Coffeyville, Kansas.

*A change in an owner's requirements has put*

Several Slightly Used
Model 54, 1928

6-cylinder, 28-passenger

White Parlor Car Busses

in our Used Bus Department

*Write for full particulars*

THE WHITE CO.
2520 S. Wabash Ave., Chicago, Ill.

FOR SALE

ROTARIES

3—300 kw., 25 cycle, 3 phase, 600 volt, D.C., G. E. with 185 kw. and 110 kw. air cooled transformers, also switchboard equipment for same.

Chicago North Shore & Milwaukee R. R.
E. E. Kretschmer, Director of Purchases,
79 W. Monroe Street, Chicago, Ill.

SUPPLIES

We have just purchased the entire supply depot of the Hudson Valley Traction Line containing a lot of valuable motors and new parts for same. Also miscellaneous car parts. Will make very attractive prices for quick shipment. Also we have on hand 2000 tons of 60-lb., 70-lb. and 80-lb. relaying rail from this line.

M. K. FRANK
Union Trust Bldg., Pittsburgh, Pa.
Park Row Bldg., New York, N. Y.

FOR SALE

5 BIRNEY CARS

Less than three years old, 70,000 miles, doubls end, single truck, excellent condition, G. E. equipped pneumatic operated doors, 32 passengers, built on Brill Co.'s Miami specifications. Details furnished on request.

CITY COMMISSION, Corsl Gables, Fla.

**"Opportunity" Advertising:**

Think
*"SEARCHLIGHT"*
First!

# Saving is a good habit, BUT—
# Why Save Things You'll Never Use?

WHY let Mother Nature grow grass between the wheels of replaced cars? Why pile up rails, shop equipment, power plant equipment, line equipment, car appliances, road building material, etc., etc., you will never use again?

TODAY you can turn them over at a fair price. Tomorrow they will be—JUNK. Is it not the better part of good horse-sense to dispose of them NOW?

6000 other electric railway men will see your advertisements of used or surplus equipment and materials here—in the Searchlight Section of their business paper.

Some of these men—officials or executives of other lines in other parts of the country and operating under different conditions—can use what you no longer need. For an insignificant investment you can tell these others what you have. And they will buy.

One "Searchlight" advertiser wrote, "We can cheerfully recommend the Searchlight Section as a wonderful medium for reaching buyers of rails and equipment." Another—"The strongest proof that your 'Searchlight' finds its way to many readers is shown by the numerous letters we have received in answer to our recent ad."

Let us tell you the cost of advertising your used or surplus equipment and materials in the Searchlight Section. Just address a list of what you have to dispose of to the

Searchlight Department

ELECTRIC RAILWAY JOURNAL

Tenth Ave. at 36th St., New York, N. Y.

DEALERS IN SCRAP METALS FOR OVER THIRTY YEARS

# Heartiest Season's Greetings

To our many friends in the electric railway industry, we extend our cordial good wishes.

It is pleasant to look back over the past year and think of our old friends as well as those who during the year we have been privileged to serve for the first time.

To you all, may the coming year be prosperous — a year during which you will reap greater benefits than ever before from the good will which you, too, are fostering among those you serve.

L. Schiavone & Bonomo Bros., Inc.
Jersey City, N. J.

# WHAT AND WHERE TO BUY

**Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors Advertising in this Issue**

This index is published as a convenience to the reader. Every care is taken to make it accurate, but *Electric Railway Journal* assumes no responsibility for errors or omissions.

**Advertising, Street Car**
Collier, Inc., Barron G.

**Air Brakes**
General Electric Co.
Westinghouse Tr. Br. Co.

**Anchors, Guy**
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

**Armature Shop Tools**
Columbia Machine Works
Elec. Service Supplies Co.

**Automatic Return Switch Stands**
Ramapo Ajax Corp.

**Automatic Safety Switch Stands**
Ramapo Ajax Corp.

**Axles**
Bemis Car Truck Co.
Bethlehem Steel Co.
Brill Co., The J. G.
Cincinnati Car Co.
Illinois Steel Co.
Westinghouse E. & M. Co.

**Babbitting Devices**
Columbia Machine Works

**Badges and Buttons**
Elec. Service Supplies Co.
International Reg. Co., The

**Barges, Steel**
American Bridge Co.

**Batteries, Dry**
Nichols-Lintern Co.

**Bearings, Anti-Friction**
Timken Roller Bearing Co.

**Bearings and Bearing Metals**
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works
Westinghouse E. & M. Co.

**Bearings, Center and Roller Side**
Cincinnati Car Co.
Columbia Machine Works
Stucki Co., A.

**Bearings, Roller**
Timken Roller Bearing Co.

**Bearings, Thrust**
Timken Roller Bearing Co.

**Bells and Buzzers**
Consolidated Car Htg. Co.

**Bells and Gongs**
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works
Elec. Service Supplies Co.

**Benders, Rail**
Railway Trackwork Co.

**Bodies, Bus**
Brill Co. The J. G.

**Bolts, Case Hardened**
American Steel Foundries
Bemis Car Truck Co.

**Bolts and Nuts, Track**
Illinois Steel Co.

**Bond Testers**
American Steel & Wire Co.
Electric Service Supplies Co.

**Bonding Apparatus**
American Steel & Wire Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.

**Bonds, Rail**
American Steel & Wire Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.
Westinghouse E. & M. Co.

**Books**
McGraw-Hill Bk. Co.

**Brackets and Cross Arms (See also Poles, Ties, Posts, etc.)**
American Bridge Co.
Columbia Machine Works
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.

**Brake Adjusters**
American Steel Foundries
Brill Co., The J. G.
Cincinnati Car Co.
National Ry. Appliance Co.
Westinghouse Tr. Br. Co.

**Brake Shoes**
Bemis Car Truck Co.
Brill Co., The J. G.

**Brake Testers**
National Ry. Appliance Co.

**Brakes, Brake Systems and Brake Parts**
American Steel Foundries
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works
General Electric Co.
National Brake Co.
Safety Car Devices Co.
Westinghouse Tr. Br. Co.

**Brakes, Magnetic Rail**
Cincinnati Car Co.

**Bridges, Steel**
American Bridge Co.

**Brushes, Carbon**
General Electric Co.
Westinghouse E. & M. Co.

**Brushholders**
Columbia Machine Works
General Electric Co.

**Buildings, Steel**
American Bridge Co.

**Buckers, Coal**
American Bridge Co.

**Buses**
Studebaker Corp. of America

**Buses, Motor**
General Electric Co.
General Motors Truck Co.

**Bus Lighting**
National Ry. Appliance Co.

**Bushings, Case Hardened and Manganese**
American Steel Foundries
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works

**Cables (See Wires and Cables)**

**Cambric Tapes, Yellow and Black Varnish**
General Electric Co.

**Carbon Brushes (See Brushes, Carbon)**

**Car Lighting Fixtures**
Elec. Service Supplies Co.

**Car Panel Safety Switches**
Consolidated Car Htg. Co.
Westinghouse E. & M. Co.

**Car Steps, Safety**
Cincinnati Car Co.

**Car Wheels, Rolled Steel**
Bethlehem Steel Co.

**Cars, Dump**
Brill Co., The J. G.
Differential Steel Car Co.

**Cars, Gas-Electric**
Brill Co., The J. G.
General Electric Co.
Westinghouse E. & M. Co.

**Cars, Gas, Rail**
Brill Co., The J. G.

**Cars, Passenger, Freight, Express, etc.**
American Car Co.
Brill Co., The J. G.
Cincinnati Car Co.
Kuhlman Car Co., G. C.
Wason Mfg. Co.

**Cars, Self-Propelled**
Brill Co., The J. G.

**Castings, Brass Composition or Copper**
Cincinnati Car Co.
Columbia Machine Works

**Castings, Gray Iron and Steel**
American Bridge Co.
American Steel Foundries
Bemis Car Truck Co.
Columbia Machine Works
Standard Steel Works

**Castings, Malleable & Brass**
Bemis Car Truck Co.
Columbia Machine Works
Timken Roller Bearing Co.

**Catchers and Retrievers, Trolley**
Elec. Service Supplies Co.
Ohio Brass Co.

**Change Carriers**
Cleveland Fare Box Co.
Electric Service Supplies Co.

**Change Trays**
Cincinnati Car Co.

**Circuit Breakers**
General Electric Co.
Westinghouse E. & M. Co.

**Clamps and Connectors for Wires and Cables**
Columbia Machine Works
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

**Cleaners and Scrapers, Track (See also Snow-Plows, Sweepers and Brooms)**
Brill Co., The J. G.
Cincinnati Car Co.

**Coil Banding and Winding Machines**
Columbia Machine Works
Elec. Service Supplies Co.
Westinghouse E. & M. Co.

**Coils, Armature and Field**
Columbia Machine Works
General Electric Co.
Westinghouse E. & M. Co.

**Coils, Cake and Kicking**
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.

**Coin Changers**
Johnson Fare Box Co.

**Coin Counting Machines**
Cleveland Fare Box Co.
International Reg. Co., The
Johnson Fare Box Co.

**Coin Sorting Machines**
Cleveland Fare Box Co.
Johnson Fare Box Co.

**Coin Wrappers**
Cleveland Fare Box Co.

**Commutator Slotters**
Columbia Machine Works
Elec. Service Supplies Co.
Westinghouse E. & M. Co.

**Commutators or Parts**
Columbia Machine Works
General Electric Co.
Westinghouse E. & M. Co.

**Compressors, Air**
General Electric Co.
Westinghouse Tr. Br. Co.

**Condensers**
General Electric Co.
Westinghouse E. & M. Co.

**Connectors, Solderless**
Westinghouse E. & M. Co.

**Connectors, Trailer Car**
Columbia Machine Works
Consolidated Car Htg. Co.
Elec. Service Supplies Co.
Ohio Brass Co.

**Controllers or Parts**
Columbia Machine Works
General Electric Co.
Westinghouse E. & M. Co.

**Controller Regulators**
Elec. Service Supplies Co.

**Controlling Systems**
General Electric Co.
Westinghouse E. & M. Co.

**Converters, Rotary**
General Electric Co.
Westinghouse E. & M. Co.

**Conveying and Hoisting Machinery**
American Bridge Co.

**Copper Wire**
American Brass Co.
Anaconda Copper Mining Co.

**Copper Wire Instruments, Measuring, Testing and Recording**
American Brass Co.
Anaconda Copper Mining Co.

**Cord, Bell, Trolley, Register**
American Steel & Wire Co.
Brill Co., The J. G.
Elec. Service Supplies Co.
International Reg. Co., The
Roebling's Sons Co., John A.
Silver Lake Co.

**Cord Connectors and Couplers**
Elec. Service Supplies Co.

**Couplers Car**
American Steel Foundries
Brill Co., The J. G.
Cincinnati Car Co.
Ohio Brass Co.
Westinghouse Tr. Br. Co.

**Cowl Ventilators**
Nichols-Lintern Co.

**Cranes, Hoists & Lifts**
Electric Service Supplies Co

**Cross Arms (See Brackets)**

**Crossing Foundations**
International Steel Tie Co.

**Crossings**
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

**Crossings, Frogs & Switches**
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

**Crossings, Manganese**
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

**Crossings, Track (See Track Special Work)**

**Crossings, Trolley**
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

**Curtains & Curtain Fixtures**
Brill Co., The J. G.

**Cutting Apparatus**
General Electric Co.
Railway Trackwork Co.
Una Welding & Bonding Co.
Westinghouse Tr. Br. Co.

**Dealer's Machinery & Second Hand Equipment**
Chicago, No. Shore & Milwaukee R'l'w'y
City of Coral Gables
Frank, M. K.
Giovanni, L. & Bonomo Bros., Inc.
Union Traction Co., The
White Co., The

**Derailing Devices (See also Track Work)**

**Derailing Switches**
Ramapo Ajax Corp.

**Destination Signs**
Columbia Machine Works
Elec. Service Supplies Co.

**Detective Service**
Wish-Service, P. Edward

**Door Operating Devices**
Brill Co., The J. G.
Cincinnati Car Co.
Consolidated Car Heating Co.
National Pneumatic Co.
Safety Car Devices Co.

**Doors, Folding Vestibule**
National Pneumatic Co.
Safety Car Devices Co.

**Doors & Door Fixtures**
Brill Co., The J. G.
Cincinnati Car Co.
Hale-Kilburn Co.

**Drills, Track**
American Steel & Wire Co.
Electric Service Supplies Co.
Ohio Brass Co.

**Drum Truing Lathes**
Nat'l Rlwy. Appliance Co.

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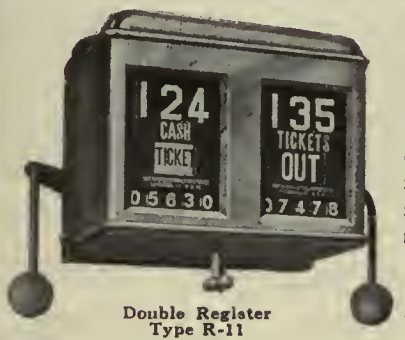


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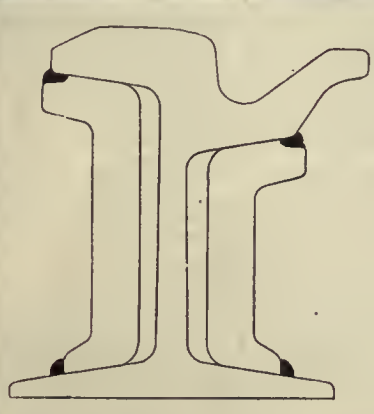
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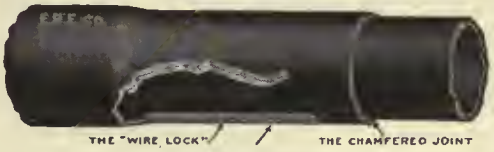
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Illinois Steel Co.

**Ties, Mechanical**
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**Ties & Tie Rods, Steel**
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International Steel Tie Co.

**Ties, Wood Cross (See Poles, Ties, Posts, etc.)**

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Johnson Fare Box Co.

**Tongue Switches**
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Elec. Service Supplies Co.
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Railway Trackwork Co.
Ramapo-Ajax Corp.

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American Bridge Co.
Westinghouse E. & M. Co.

**Track Grinders**
Railway Trackwak Co.
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**Track, Special Work**
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**Trackless Trolley Cars**
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**Transfer Tables**
American Bridge Co.

**Transformers**
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**Treads, Safety Stair, Car Step**
Cincinnati Car Co.

**Tree Wire**
Okonite Co.
Okonite-Callender Cable Co.

**Trolley Bases**
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Ohio Brass Co.
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**Trolley Bases, Retrieving**
Nuttall & Co., R. D.
Ohio Brass Co.
Westinghouse-Nuttall

**Trolley Bases**
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**Trolley Material, Overhead**
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**Trucks, Car**
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**Tubing, Steel**
Timken Roller Bearing Co.

**Turbines, Steam**
General Electric Co.
Westinghouse E. & M. Co.

**Turntables**
American Bridge Co.
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**Valves**
Ohio Brass Co.
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**Ventilators, Car**
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**Welding Processes and Apparatus**
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Una Welding & Bonding Co.
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Railway Trackwork Co.
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**Welding Wire**
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Railway Trackwork Co.
Roebling's Sons Co., J. A.

**Welding Wire and Rods**
Railway Trackwork Co.

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Bemis Car Truck Co.
Illinois Steel Co.
Standard Steel Works

**Wheels, Trolley**
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Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
Nuttall & Co., R. D.
Ohio Brass Co.
Star Brass Works
Westinghouse-Nuttall

**Wheels, Wrought Steel**
Illinois Steel Co.

**Whistles, Air**
Ohio Brass Co.
Westinghouse E. & M. Co.
Westinghouse Tr. Br. Co.

**Window Guards & Fittings**
Cincinnati Car Co.

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**Wires and Cables**
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American Steel & Wire Co.
Anaconda Copper Min. Co.
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Okonite Co.
Okonite-Callender Cable Co.
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